MTH632

6-3-21

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MTH632 Complex Analysis and Differential Geometry

Question No : 2 of 33

The logarithmic function of $e^w = z$, where $z = re^{i\theta}$ and $w = u + iv$, then _____.

Answer (Please select your correct opti

- $w = \ln r + i(\theta + 2n\pi)$
- $w = re^{i\theta}$
- $w = r + i(\theta + 2n\pi)$
- $w = -\ln r + i\theta$

Start Time: 11:39 AM

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2

Question Summary : (Attempted Question)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21

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MTH032 Complex Analysis and Differential ...

Question No : 3 of 33

The sequence $z_n = -2 + i\frac{1}{n^3}$ $(n = 1,2,3,\ldots)$ for $n \to \infty$ converges to _____ .

Answer (Please select your correct option)

- C i
- C -1
- C 1
- C -2

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3

Question Summary : (Attempted Question)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21

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MTH632 Complex Analysis and Differential Geometry

Question No : 1 of 33

In the complex valued function $U(x, y)$ is harmonic in some domain , if _____.

Answer (Please select your correct option)

- $u_{xx} - u_{yy} = 0$
- $u_{xx} + u_{yy} = 0$
- $u_{xx} = u_{yy} = 0$
- $u_{xx} = u_{yy}$

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Question Summary : (Attempted Question)

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MTH032 Complex Analysis and Differential ...

Question No : 3 of 33

The sequence $z_n = -2 + i\frac{1}{n^3}$ $(n = 1,2,3,\ldots)$ for $n \to \infty$ converges to _____ .

Answer (Please select your correct option)

- C i
- C -1
- C 1
- C -2

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Question Summary : (Attempted Question)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21

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MTH632 Complex Analysis and Differential Geometry

Question No : 2 of 33

The logarithmic function of $e^w = z$, where $z = re^{i\theta}$ and $w = u + iv$, then _____.

Answer (Please select your correct option)

- $w = \ln r + i(\theta + 2n\pi)$
- $w = re^{i\theta}$
- $w = r + i(\theta + 2n\pi)$
- $w = -\ln r + i\theta$

Start Time: 11:39 AM

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2

Question Summary : (Attempted Question)

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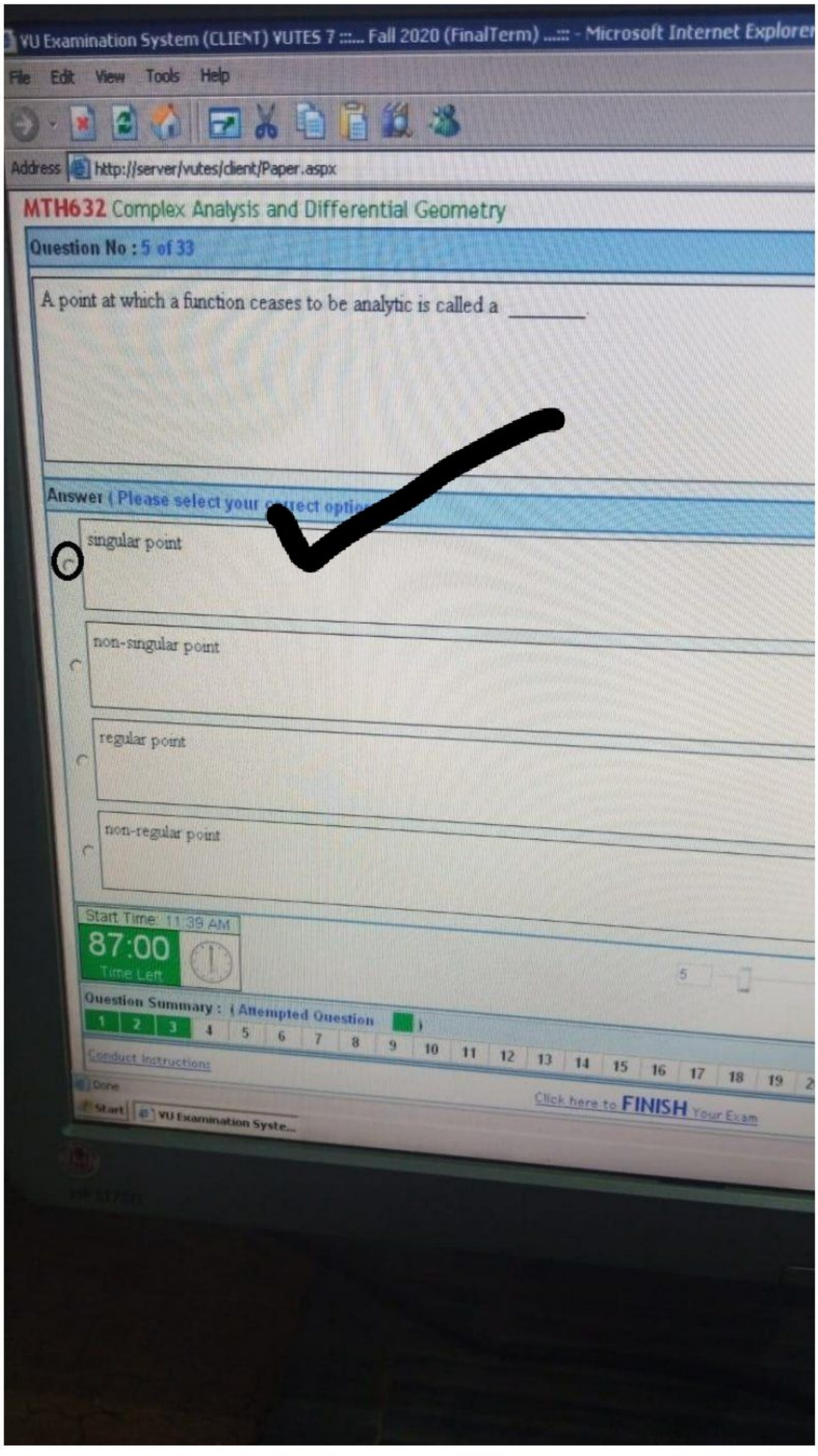
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MTH632 Complex Analysis and Differential Geometry

Question No : 6 of 33

The function $f(z) = |z|$ is non-constant _____.

Answer (Please select your correct option)

- analytic function
- nowhere analytic function
- non-analytic function
- entire function

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Question Summary : (Attempted Question)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

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MTH632 Complex Analysis and Differential Geometry

Question No : 8 of 33

The absolute convergence of a series of complex numbers implies the convergence of that _____.

Answer (Please select your correct option)

- sequence
- series

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Question Summary : (Attempted Question)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21

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MTH632 Complex Analysis and Differential Geometry

Question No : 7 of 33

A function U is said to be harmonic if and only if _____.

Answer (Please select your correct option)

- $U_{xy} + U_{yx} = 0$
- $U_x + U_y = 0$
- $U_x^2 + U_y^2 = 0$
- $U_{xx} + U_{yy} = 0$

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Question Summary : (Attempted Question)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19

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Question No : 9 of 33

If $f(z) = |\bar{z}|$, then $f(3-4i) =$ _____.

Answer (Please select your correct option)

- 0
- 5
- -5
- 12

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Question Summary : (Attempted Question)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

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MTH632 Complex Analysis and Differential Geometry

Question No : 11 of 33

The principal value of 1^{2i} is _____.

Answer (Please select your correct option)

0

1

i

2i

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Time Left

Question Summary : (Attempted Question)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

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MTH632 Complex Analysis and Differential Geometry

Question No : 12 of 33

Let Z be a complex valued function then $arcsin\ (Z)$ = _____.

Answer (Please select your correct option)

- $\log(iz + (1-z^2)^{1/2})$
- $-i\log(iz + (1-z^2)^{1/2})$
- $\log(iz - (1-z^2)^{1/2})$
- $-i\log(iz - (1-z^2))$

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12

Question Summary : (Attempted Question)

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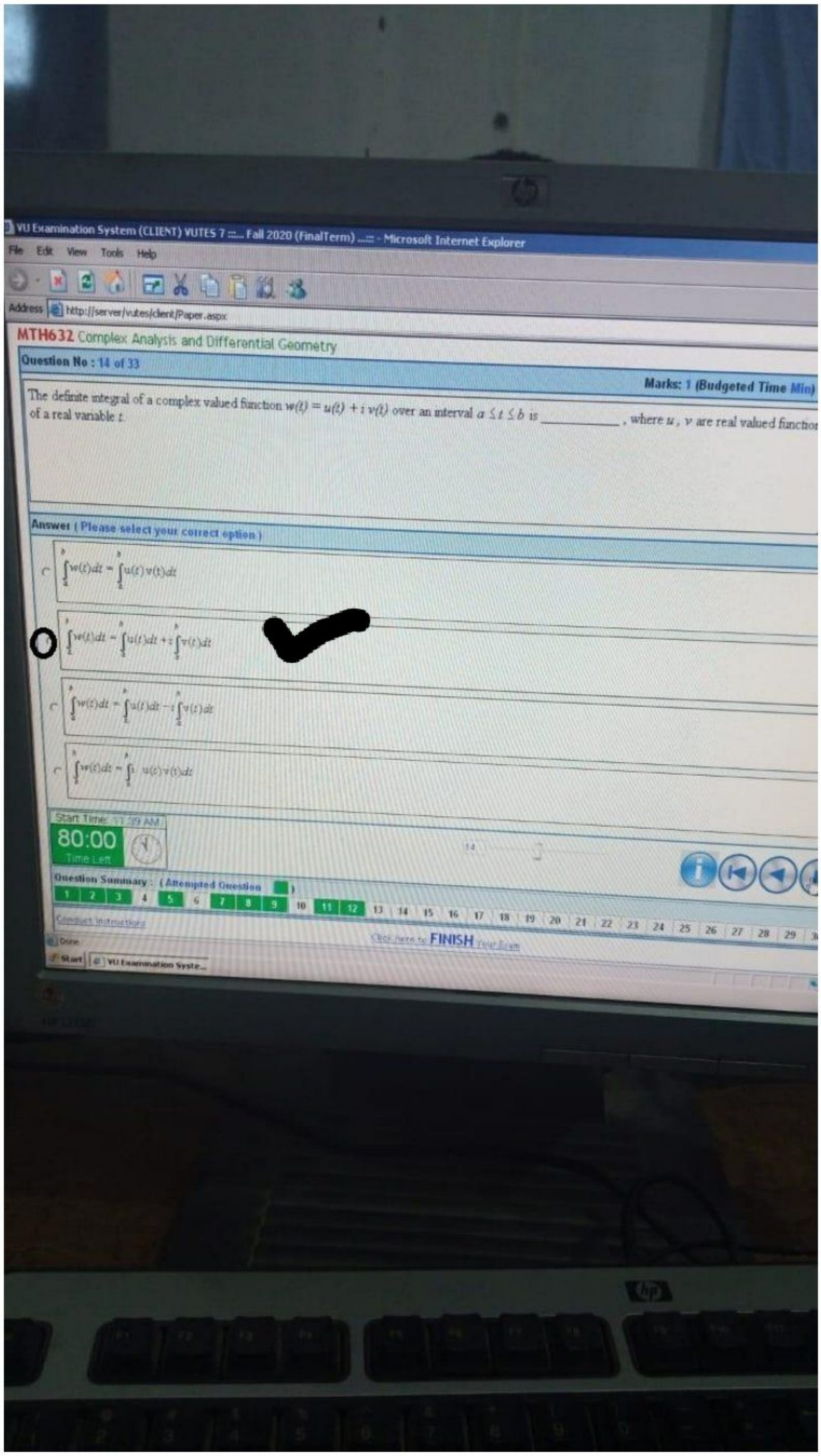
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MTH632 Complex Analysis and Differential Geometry

Question No : 13 of 33

The circle $z = e^{i\theta}$, $0 \le \theta \le 2\pi$ is centered at _____.

Answer (Please select your correct option)

- (1,1)
- (1,0)
- (0,1)
- (0,0)

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13

Question Summary : (Attempted Question)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

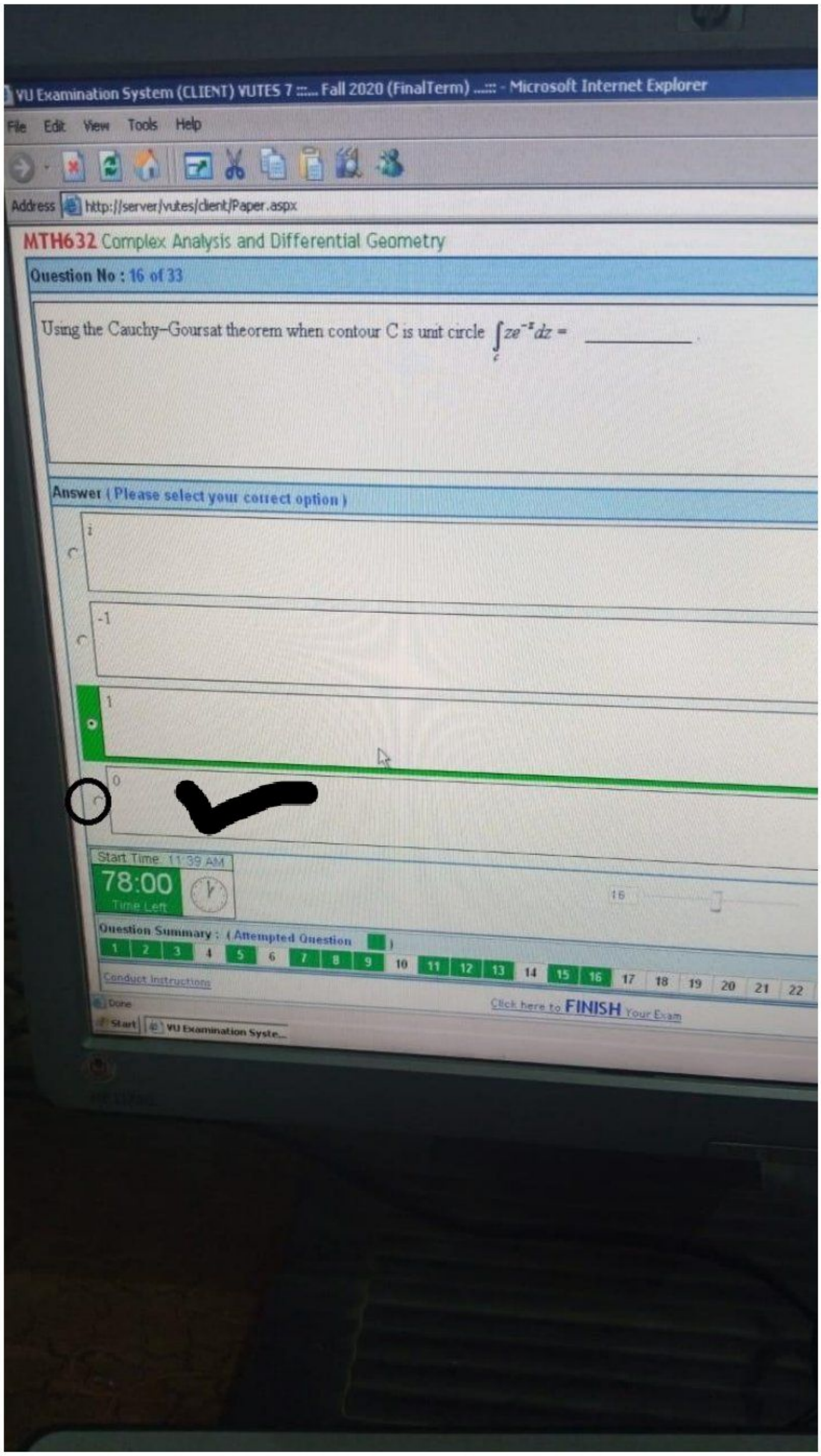
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MTH632 Complex Analysis and Differential Geometry

Question No : 15 of 33

Let $f(z)=z$ be a continuous complex valued function, then $\int_{1}^{1+i} f(z)dz =$ _____.

Answer (Please select your correct option)

- 1-i
- 0
- 1+i
- i

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Question Summary : (Attempted Question)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

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MTH632 Complex Analysis and Differential Geometry

Question No : 17 of 33

By using the Extension of Cauchy Integral formula $\int_c \frac{f(z)}{(z-z_0)^{n+1}} dz =$ _____.

Answer (Please select your correct option)

- $f^{(n)}(z_0)$
- $2\pi f^{(n)}(z_0)$
- $\frac{f^{(n)}(z_0)}{n!}$
- $\frac{2\pi}{n!} f^{(n)}(z_0)$

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Question Summary : (Attempted Question)

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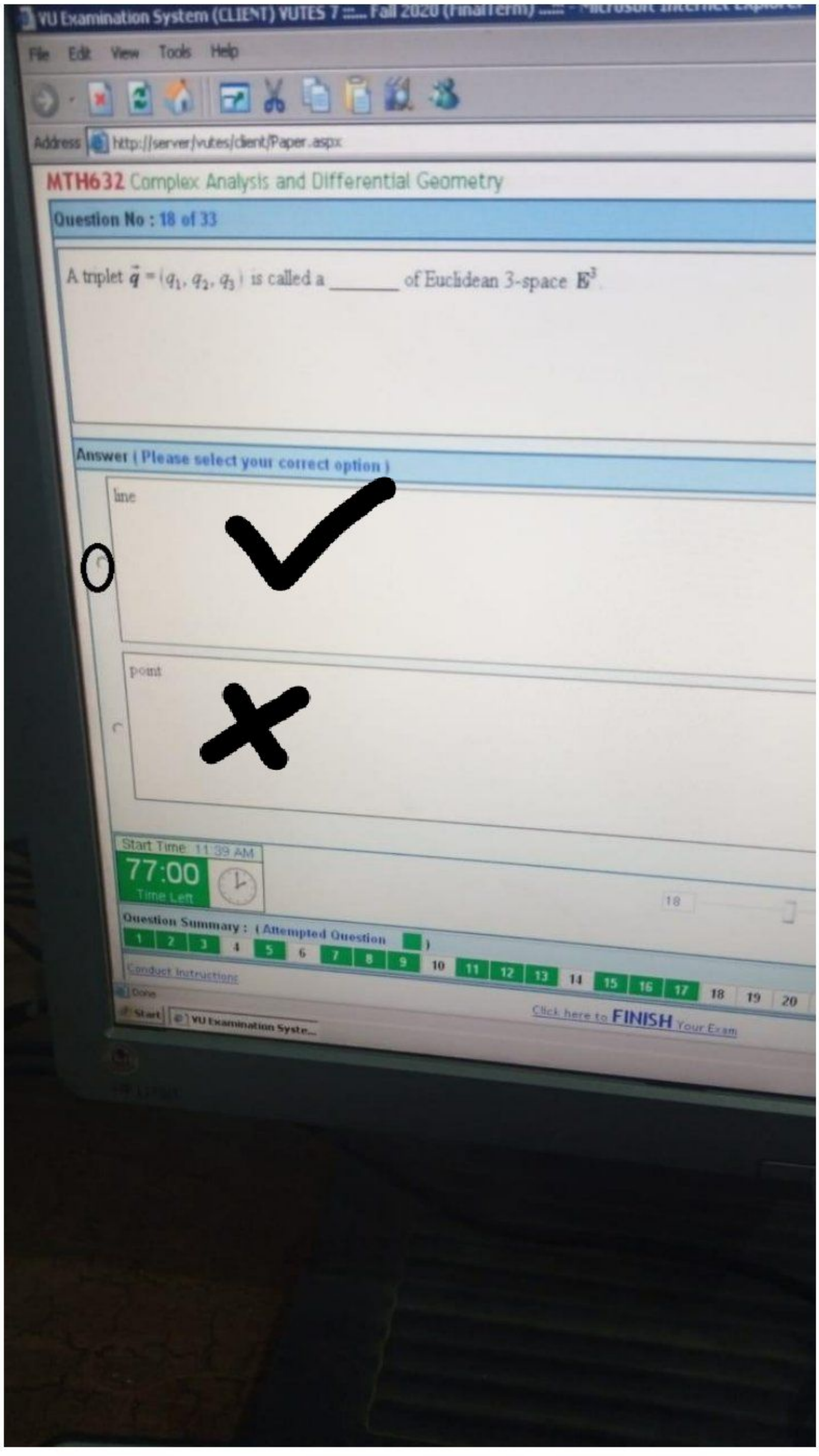
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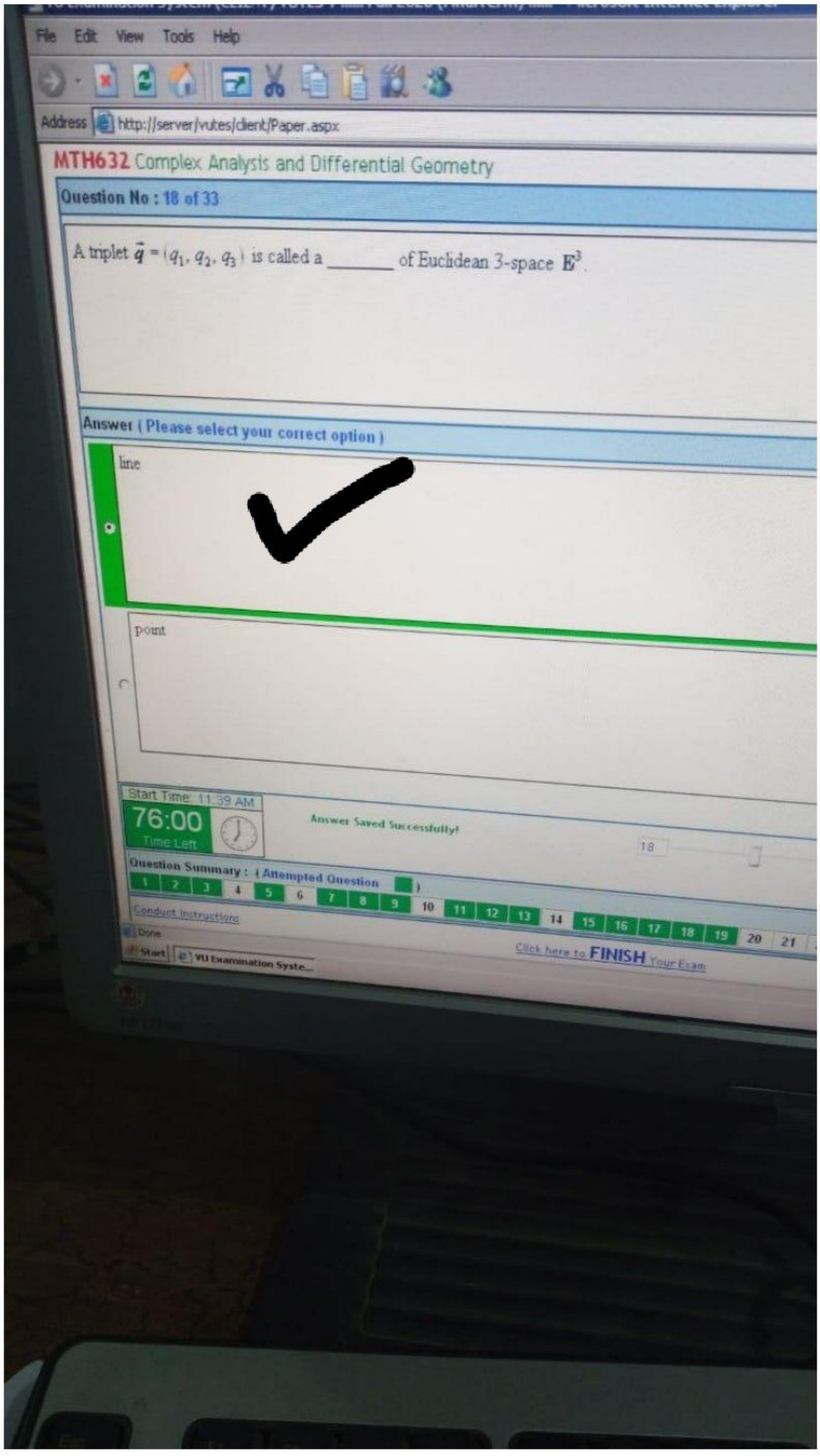
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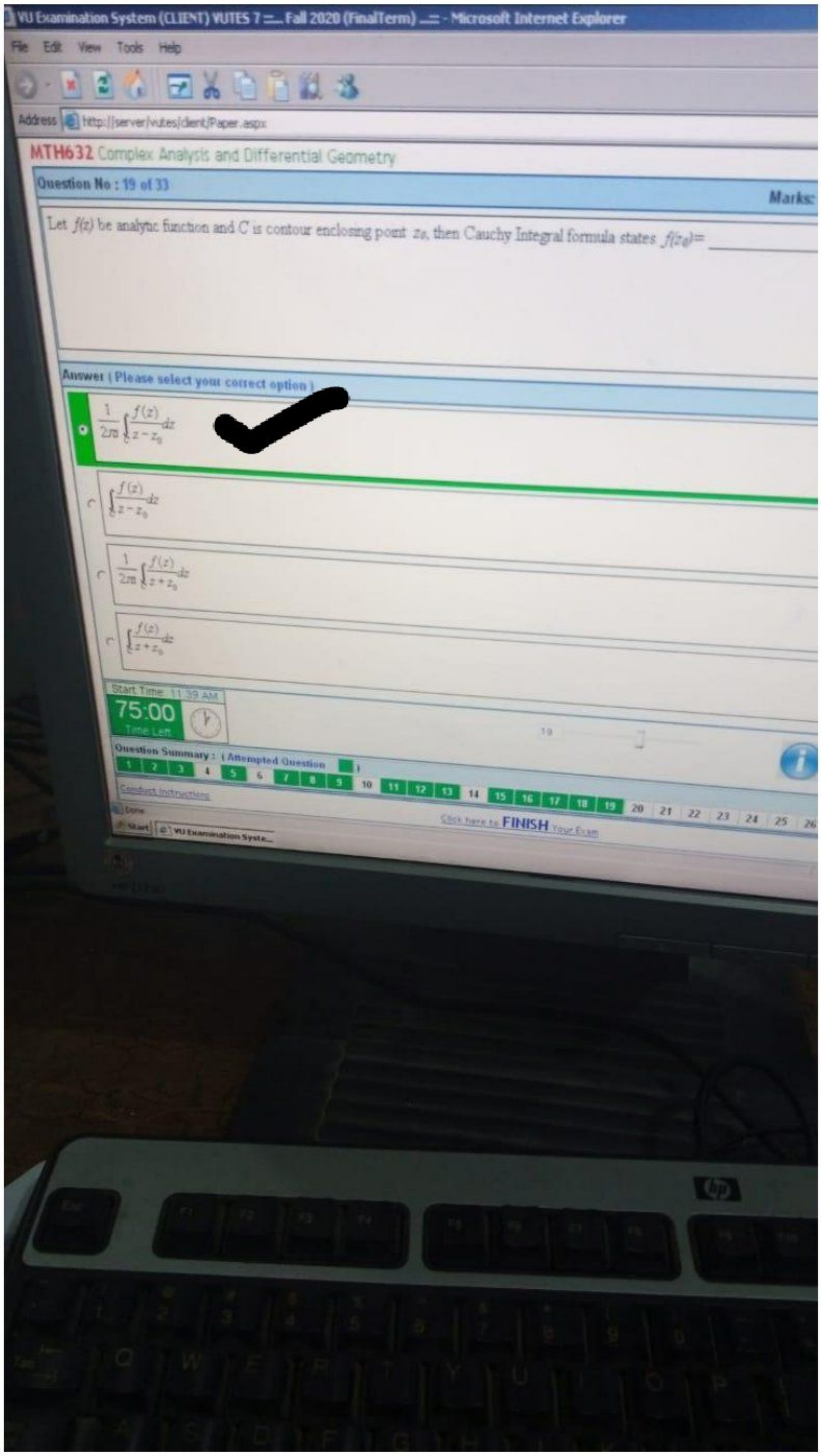
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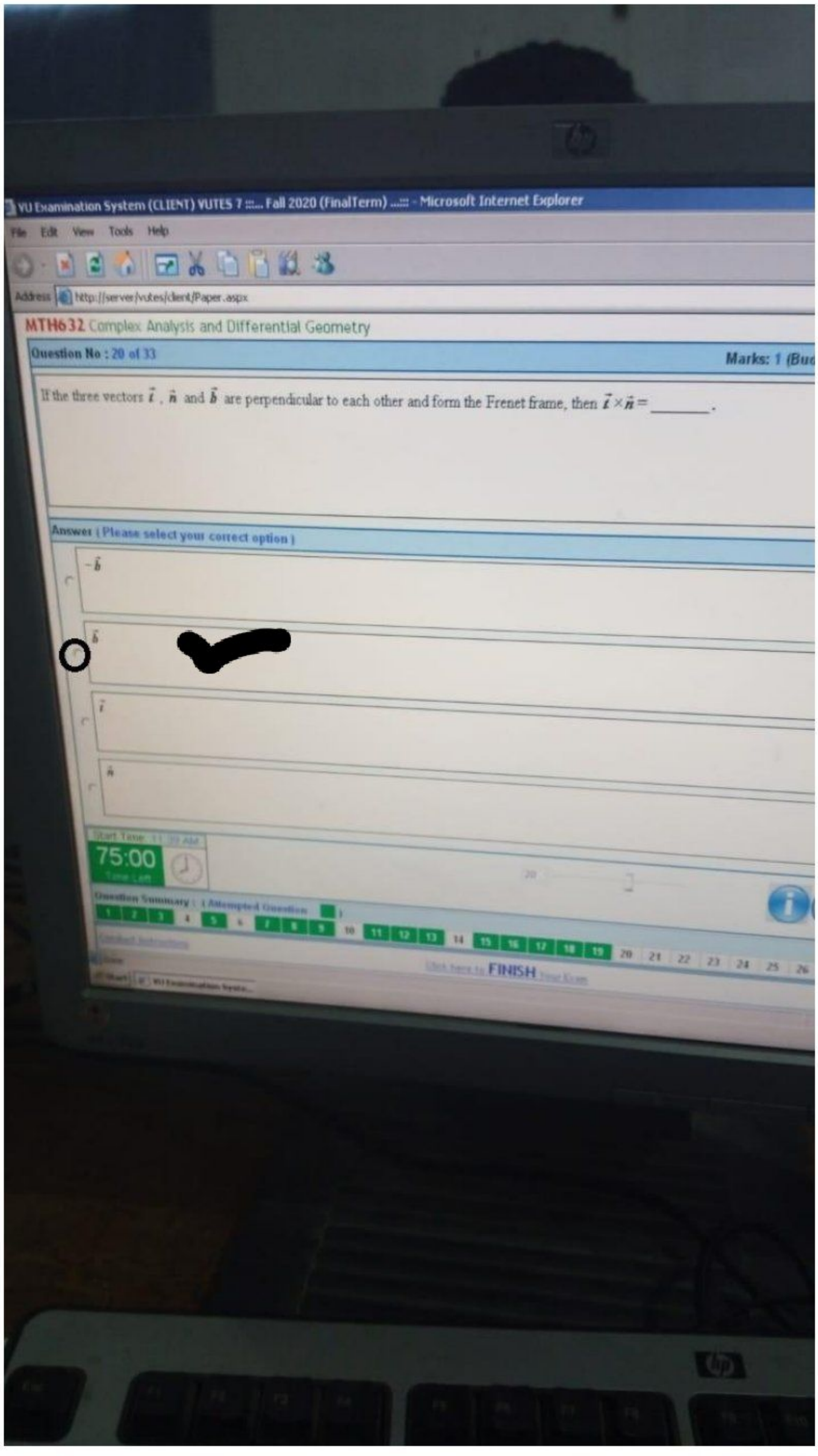
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H632 Complex Analysis and Differential Geometry

estion No : 21 of 33 Mar

If the three vectors $\vec{t}$, $\vec{n}$ and $\vec{b}$ are perpendicular to each other and form the Frenet frame, then $\vec{b} \times \vec{t} =$ _____.

Answer (Please select your correct option)

- $\vec{b}$
- $\vec{t}$
- $\vec{n}$
- $-\vec{n}$

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Question Summary : (Attempted Question)

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MTH632 Complex Analysis and Differential Geometry

Question No : 1 of 33

In the complex valued function $U(x, y)$ is harmonic in some domain , if _____.

Answer (Please select your correct option)

- $u_{xx} - u_{yy} = 0$
- $u_{xx} + u_{yy} = 0$
- $u_{xx} = u_{yy} = 0$
- $u_{xx} = u_{yy}$

Start Time: 11:39 AM

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Question Summary : (Attempted Question)

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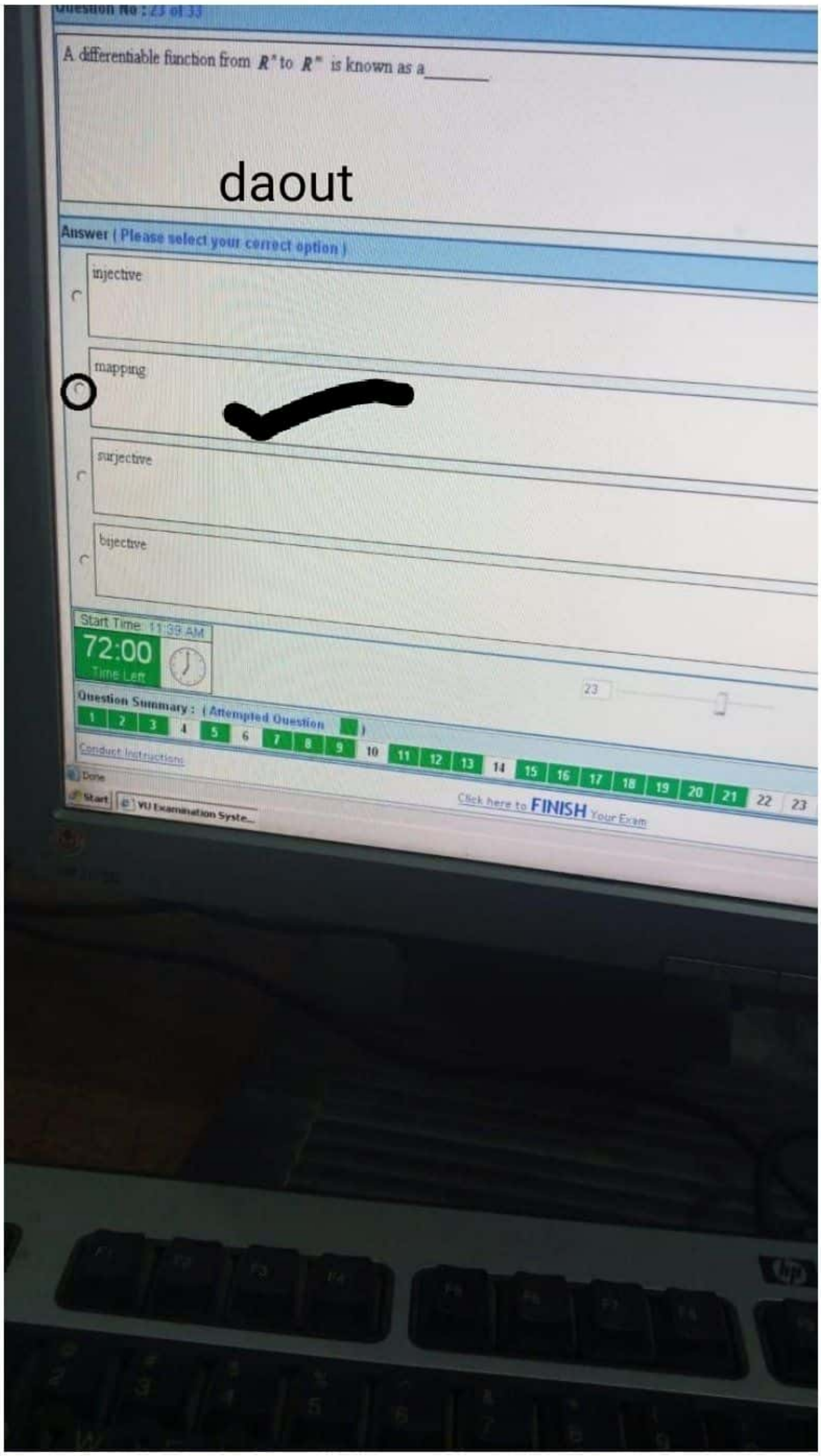
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MTH632 Complex Analysis and Differential Geometry

Question No : 24 of 33

The restriction of a curve $\alpha: I \to R^3$ to a close interval $[a, b]$ is known as a _____.

Answer (Please select your correct option)

- curve
- segment
- line
- curve segment

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Question Summary : (Attempted Question)

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MTH632 Complex Analysis and Differential Geometry

Question No : 25 of 33

Let $\beta : I \to R^3$ be a unit speed curve. The velocity $T = \beta'$, is said to be the _____ on β.

Answer (Please select your correct option)

- unit
- unit tangent vector field
- vector
- tangent

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25

Question Summary : (Attempted Question)

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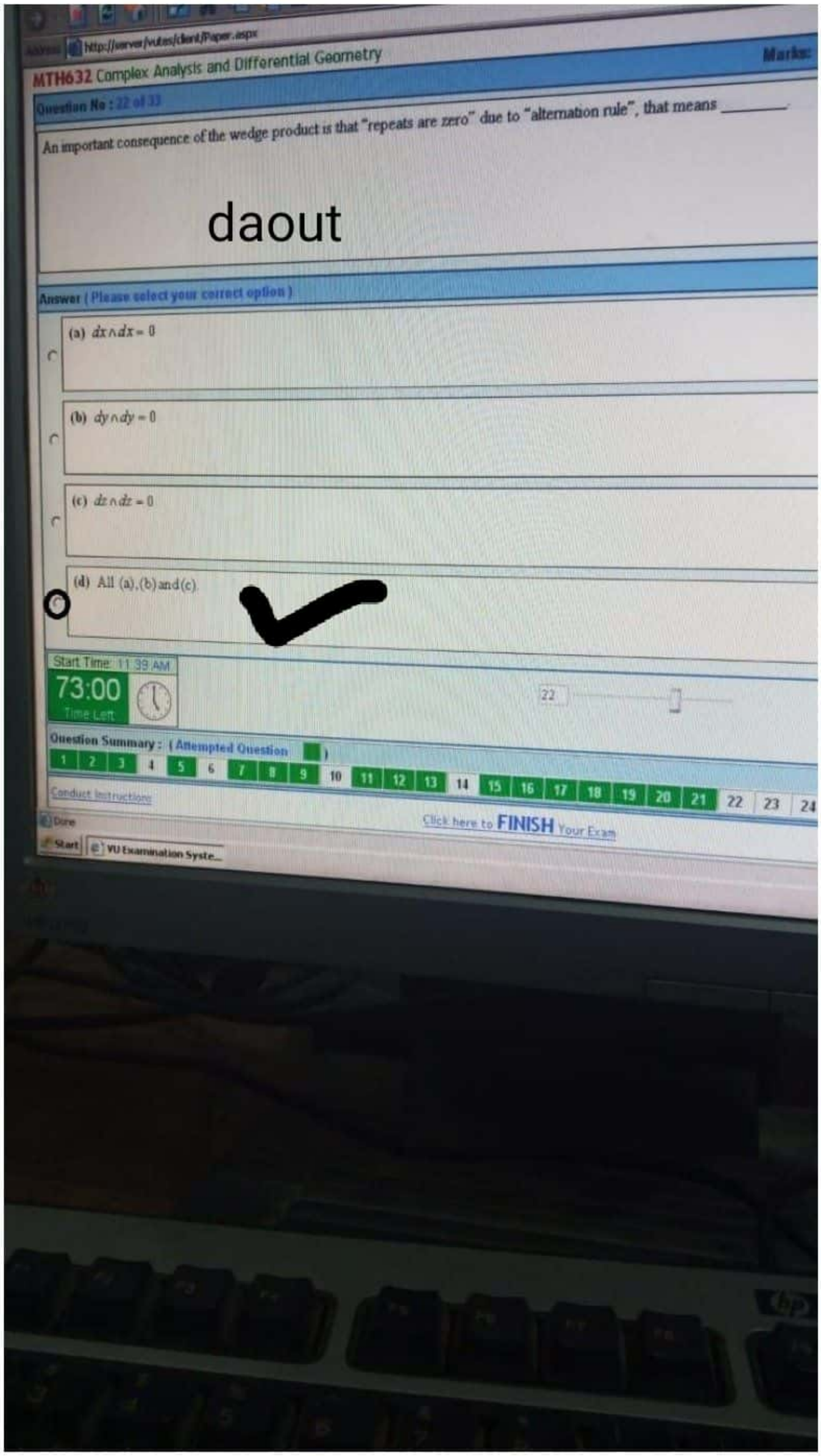
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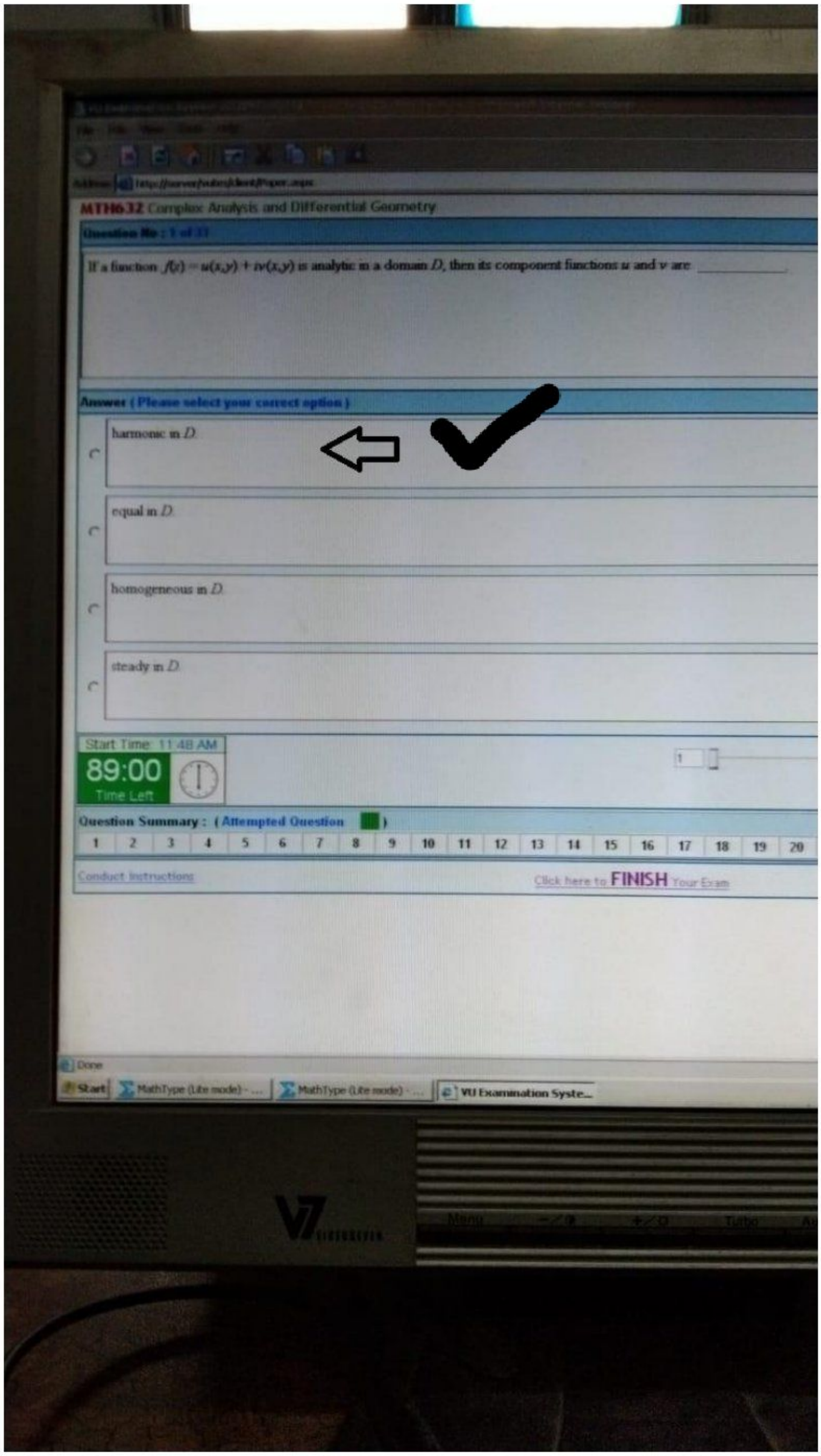
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MTH632 Complex Analysis and Differential Geometry

Question No : 2 of 33

If Z_1 and Z_2 are two nonzero complex numbers then $Log(z_1 z_2) =$ _____.

Answer (Please select your correct option)

- $Log\, z_1 \, Log\, z_2$
- $Log\, z_1 / Log\, z_2$
- $Log\, z_1 - Log\, z_2$
- $Log\, z_1 + Log\, z_2$

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Question Summary : (Attempted Question)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

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MTH632 Complex Analysis and Differential Geometry

Question No : 3 of 33

The sequence $z_n = \frac{i}{n^2}$ $(n = 1,2,3,\ldots)$ for $n \to \infty$ converges to _____.

Answer (Please select your correct option)

- 1
- 0
- infinity
- 1/2

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Question Summary : (Attempted Question)

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MTH632 Complex Analysis and Differential Geometry

Question No : 4 of 33

If $f(z) = x + ay + i(bx + cy)$ is analytic, then a, b, c equals to _____

Answer (Please select your correct option)

- $c=1$ and $a=-b$ ✔
- $a=1$ and $c=-b$
- $b=1$ and $a=-c$
- $a=b=c=1$

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Question Summary : (Attempted Question)

1	2	3	4	5	6	7	8	9	10	11	12	13

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MTH632 Complex Analysis and Differential Geometry

Question No : 5 of 33

The function $f(z) = |z|$ is non-constant _____.

Answer (Please select your correct option)

- analytic function
- nowhere analytic function
- non-analytic function
- entire function

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Question Summary : (Attempted Question)

1	2	3	4	5	6	7	8	9	10	11	12

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MTH632 Complex Analysis and Differential Geometry

Question No :

If a series of complex numbers converges, the n^{th} term converges to zero as n tends to _____

Answer (Please select your correct option)

- infinity
- finite numbers

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Question Summary : (Attempted Question)

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MTH632 Complex Analysis and Differential Geometry

Question No : 7

If $e^{ax}\cos y$ is harmonic then 'a' is _____.

Answer (Please select your correct option)

- 0
- -1
- 2
- i ⇦ ✓

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Question Summary : (Attempted Question ▮)

1	2	3	4	5	6	7	8	9	10

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MTH632 Complex Analysis and Differential Geometry

Question No : 8 of 33

A series converges to a number S if and only if the sequence of remainders tends to _____.

Answer (Please select your correct option)

- infinity
- one
- zero

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Question Summary : (Attempted Question)

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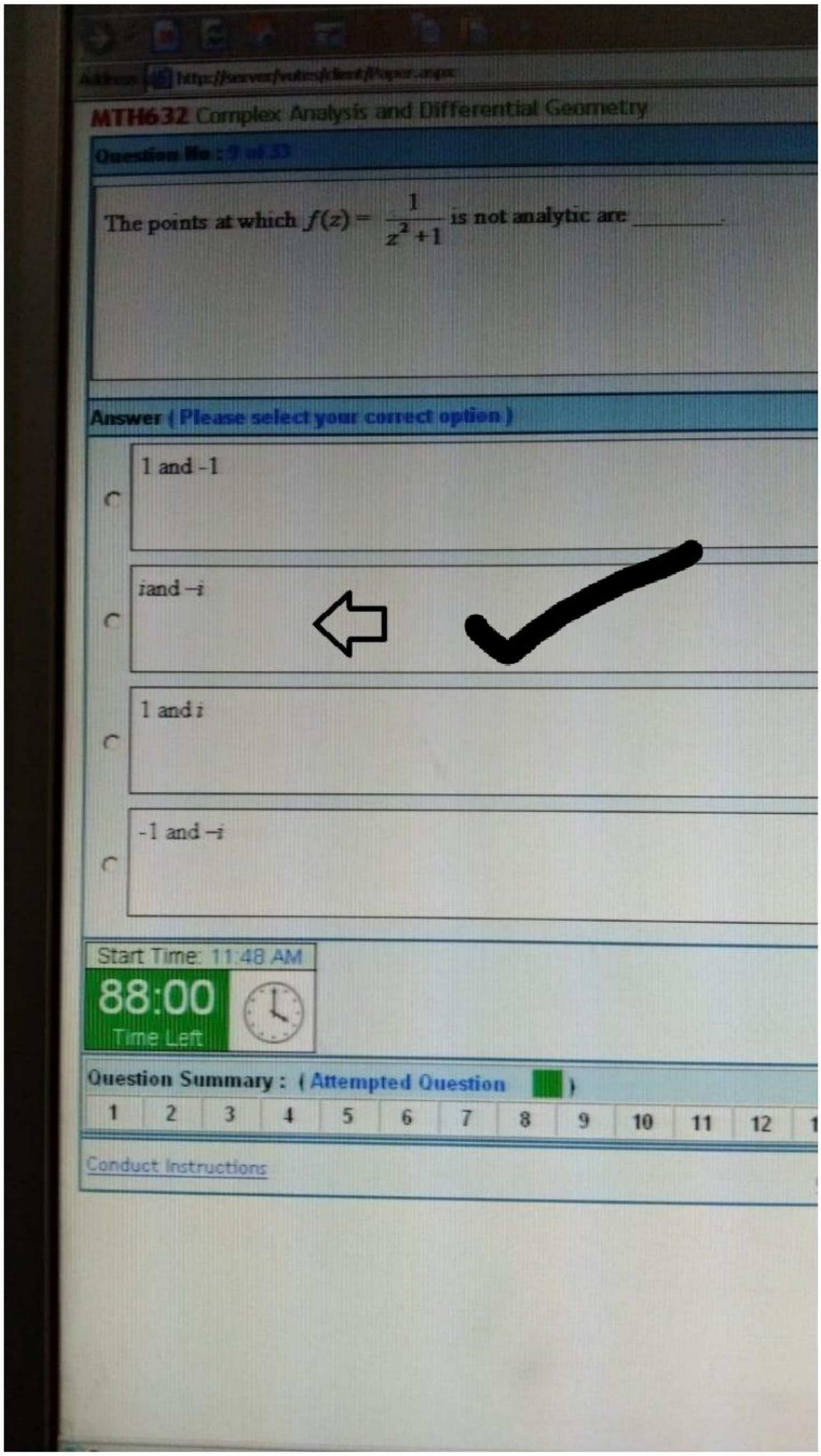
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MTH632 Complex Analysis and Differential Geometry

In the trigonometric functions of complex numbers $\sin z =$ _____

Answer (Please select your correct option)

C $\frac{e^{iz} - e^{-iz}}{2i}$

C $\frac{e^{iz} - e^{-iz}}{2}$

C $\frac{e^{-iz} - e^{iz}}{2i}$

C $\frac{e^{-iz} - e^{iz}}{2}$

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Question Summary : (Attempted Question)

1	2	3	4	5	6	7	8	9	10	11	12	13

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MTH632 Complex Analysis and Differential Geometry

Question No : 11 of 20

The principal value of 1^{2i} is _____.

Answer (Please select your correct option)

- 0
- 1
- i
- 2i

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Question Summary : (Attempted Question)

1	2	3	4	5	6	7	8	9	10

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MTH632 Complex Analysis and Differential Geometry

Question No : 2 of 33

If Z_1 and Z_2 are two nonzero complex numbers then $Log(z_1 z_2) =$ _____.

Answer (Please select your correct option)

- $Log\, z_1 \, Log\, z_2$
- $Log\, z_1 / Log\, z_2$
- $Log\, z_1 - Log\, z_2$
- $Log\, z_1 + Log\, z_2$

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Question Summary : (Attempted Question)

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MTH632 Complex Analysis and Differential Geometry

Question No : 3 of 33

The sequence $z_n = \frac{i}{n^2}$ $(n = 1,2,3,\ldots)$ for $n \to \infty$ converges to _____.

Answer (Please select your correct option)

- 1
- 0
- infinity
- 1/2

Start Time: 11:48 AM

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Question Summary : (Attempted Question)

1	2	3	4	5	6	7	8	9	10	11	12	13	14

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MTH632 Complex Analysis and Differential Geometry

Question No : 4 of 33

If $f(z) = x + ay + i(bx + cy)$ is analytic, then a, b, c equals to _____

Answer (Please select your correct option)

- $c=1$ and $a=-b$
- $a=1$ and $c=-b$
- $b=1$ and $a=-c$
- $a=b=c=1$

Start Time: 11:48 AM

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Question Summary : (Attempted Question)

1	2	3	4	5	6	7	8	9	10	11	12	13

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MTH632 Complex Analysis and Differential Geometry

Question No : 5 of 33

The function $f(z) = |z|$ is non-constant _____.

Answer (Please select your correct option)

- analytic function
- nowhere analytic function
- non-analytic function
- entire function

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Question Summary : (Attempted Question)

1	2	3	4	5	6	7	8	9	10	11	12

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MTH632 Complex Analysis and Differential Geometry

Question No :

If a series of complex numbers converges, the n^{th} term converges to zero as n tends to _____

Answer (Please select your correct option)

infinity

finite numbers

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Question Summary : (Attempted Question)

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MTH632 Complex Analysis and Differential Geometry

Question No : 7

If $e^{ax}\cos y$ is harmonic then 'a' is _____.

Answer (Please select your correct option)

- 0
- -1
- 2
- i

Start Time: 11:48 AM

88:00 Time Left

Question Summary : (Attempted Question)

1	2	3	4	5	6	7	8	9	10

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MTH632 Complex Analysis and Differential Geometry

Question No : 8 of 33

A series converges to a number S if and only if the sequence of remainders tends to _____.

Answer (Please select your correct option)

- infinity
- one
- zero

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Question Summary : (Attempted Question)

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MTH632 Complex Analysis and Differential Geometry

Question No : 9 of 33

The points at which $f(z) = \dfrac{1}{z^2+1}$ is not analytic are _____.

Answer (Please select your correct option)

- 1 and -1
- i and $-i$
- 1 and i
- -1 and $-i$

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Question Summary : (Attempted Question)

1	2	3	4	5	6	7	8	9	10	11	12	1

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MTH632 Complex Analysis and Differential Geometry

Question No :

In the trigonometric functions of complex numbers Sin x = _____

Answer (Please select your correct option)

C $\frac{e^{ix} - e^{-ix}}{2i}$ ⇦

C $\frac{e^{ix} - e^{-ix}}{2}$

C $\frac{e^{-ix} - e^{ix}}{2i}$

C $\frac{e^{-ix} - e^{ix}}{2}$

Start Time: 11:48 AM

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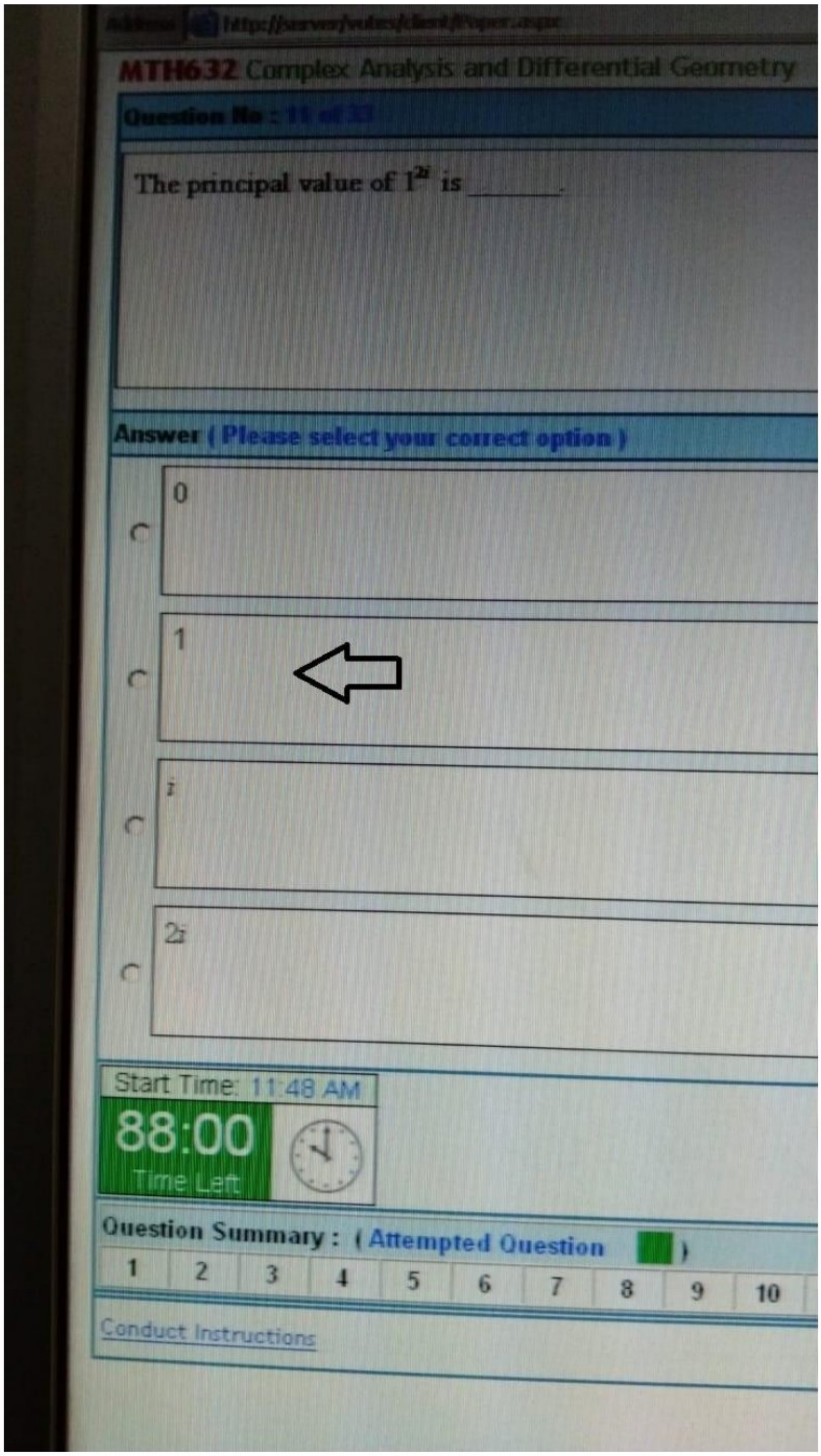
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MTH632 Complex Analysis and Differential Geometry

In the trigonometric functions of complex numbers Sin x = _____

Answer (Please select your correct option)

C $\frac{e^{ix} - e^{-ix}}{2i}$

C $\frac{e^{ix} - e^{-ix}}{2}$

C $\frac{e^{-ix} - e^{ix}}{2i}$

C $\frac{e^{-ix} - e^{ix}}{2}$

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Question Summary : (Attempted Question)

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MTH632 Complex Analysis and Differential Geometry

In the trigonometric functions of complex numbers Sin x = _____

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- $\frac{e^{ix} - e^{-ix}}{2i}$
- $\frac{e^{ix} - e^{-ix}}{2}$
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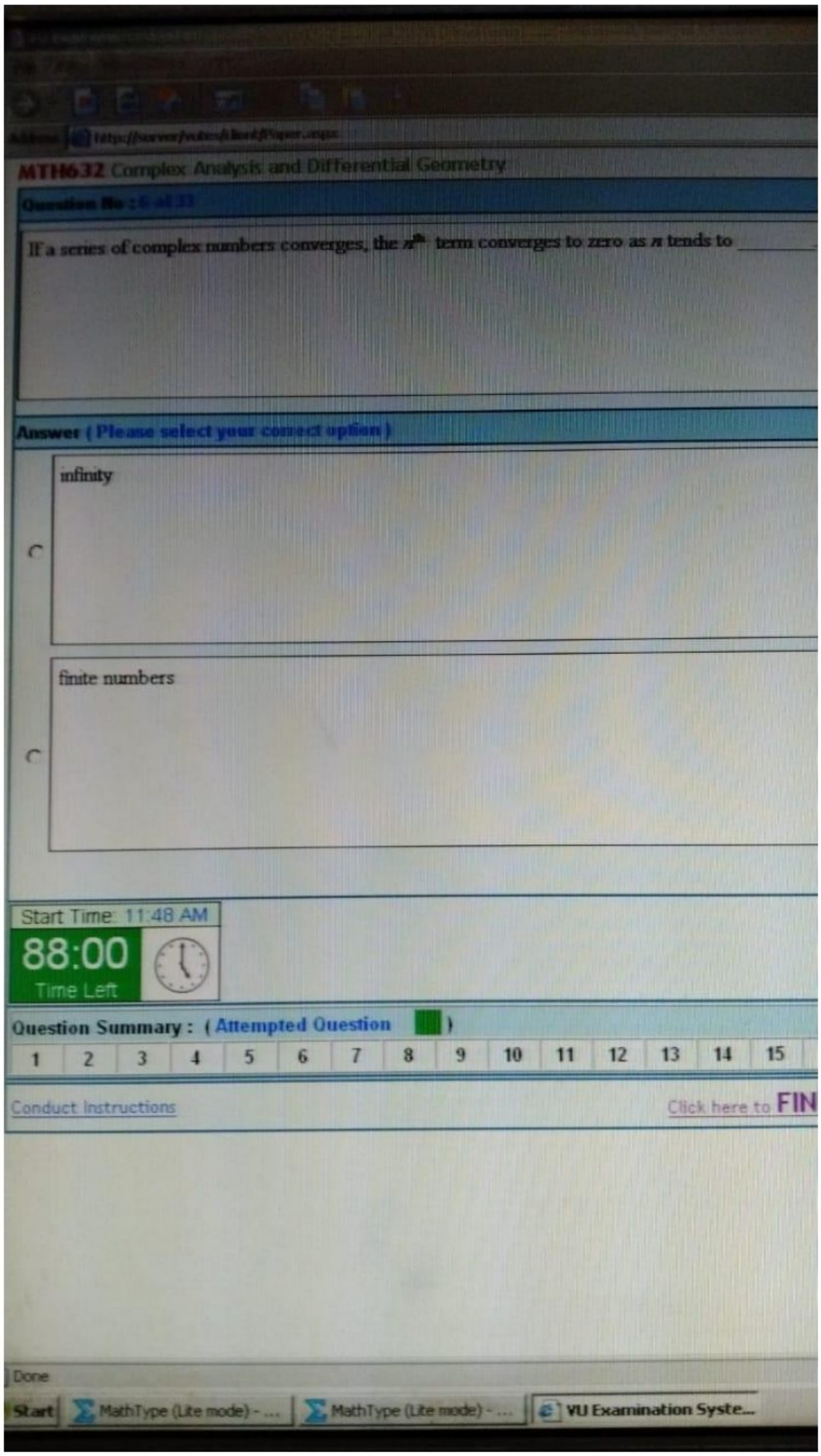
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MTH632 Complex Analysis and Differential Geometry

Question No : 6 of 33

If a series of complex numbers converges, the n^{th} term converges to zero as n tends to _____.

Answer (Please select your correct option)

- infinity
- finite numbers

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Question Summary : (Attempted Question)

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MTH632 Complex Analysis and Differential Geometry

Question No : 5 of 33

The function $f(z) = |z|$ is non-constant _____.

Answer (Please select your correct option)

- analytic function
- nowhere analytic function
- non-analytic function
- entire function

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Question Summary : (Attempted Question)

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MTH632 Complex Analysis and Differential Geometry

Question No : 4 of 33

If $f(z) = x + ay + i(bx + cy)$ is analytic, then a, b, c equals to _____

Answer (Please select your correct option)

- $c=1$ and $a=-b$
- $a=1$ and $c=-b$
- $b=1$ and $a=-c$
- $a=b=c=1$

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Question Summary : (Attempted Question)

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MTH632 Complex Analysis and Differential Geometry

Question No : 4 of 33

If $f(z) = x + ay + i(bx + cy)$ is analytic, then a, b, c equals to _____

Answer (Please select your correct option)

- C $c=1$ and $a=-b$
- C $a=1$ and $c=-b$
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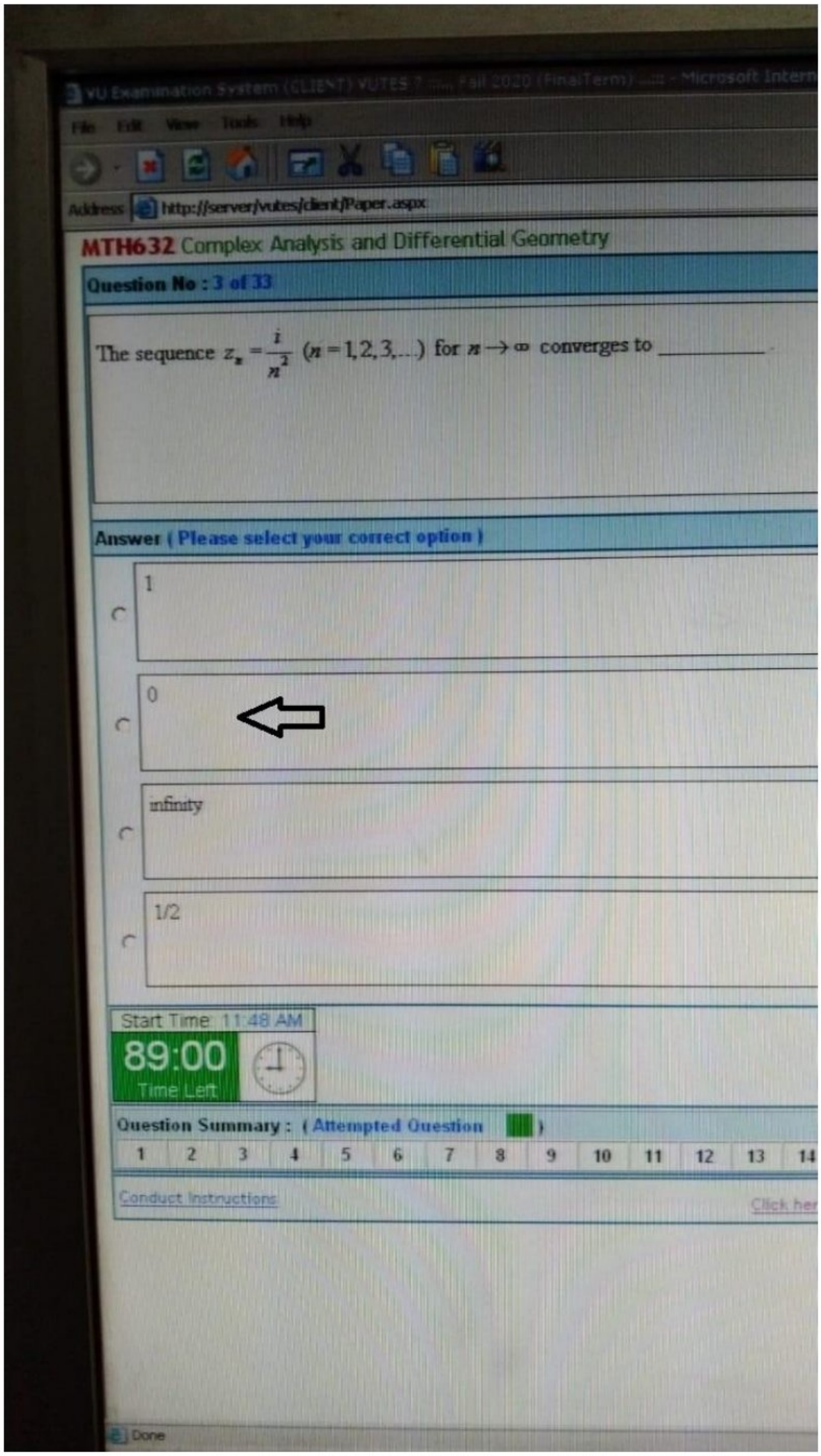
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MTH632 Complex Analysis and Differential Geometry

Question No : 2 of 33

If Z_1 and Z_2 are two nonzero complex numbers then $Log(z_1 z_2) =$ _____.

Answer (Please select your correct option)

- $Log\, z_1\, Log\, z_2$
- $Log\, z_1 / Log\, z_2$
- $Log\, z_1 - Log\, z_2$
- $Log\, z_1 + Log\, z_2$ ⇦

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Question Summary : (Attempted Question)

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MTH632 Complex Analysis and Differential Geometry

Question No : 1 of 33

If a function $f(z) = u(x,y) + iv(x,y)$ is analytic in a domain D, then its component functions u and v are _____.

Answer (Please select your correct option)

- harmonic in D.
- equal in D.
- homogeneous in D.
- steady in D.

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Question Summary : (Attempted Question)

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MTH632 Complex Analysis and Differential Geometry

Question No : 12 of 33

Let Z be a complex valued function then $\sinh Z =$ _____

Answer (Please select your correct option)

- $\frac{e^{z} - e^{-z}}{2}$
- $\frac{e^{z} + e^{-z}}{2}$
- $\frac{e^{z} - e^{-z}}{2i}$
- $\frac{e^{z} + e^{-z}}{2i}$

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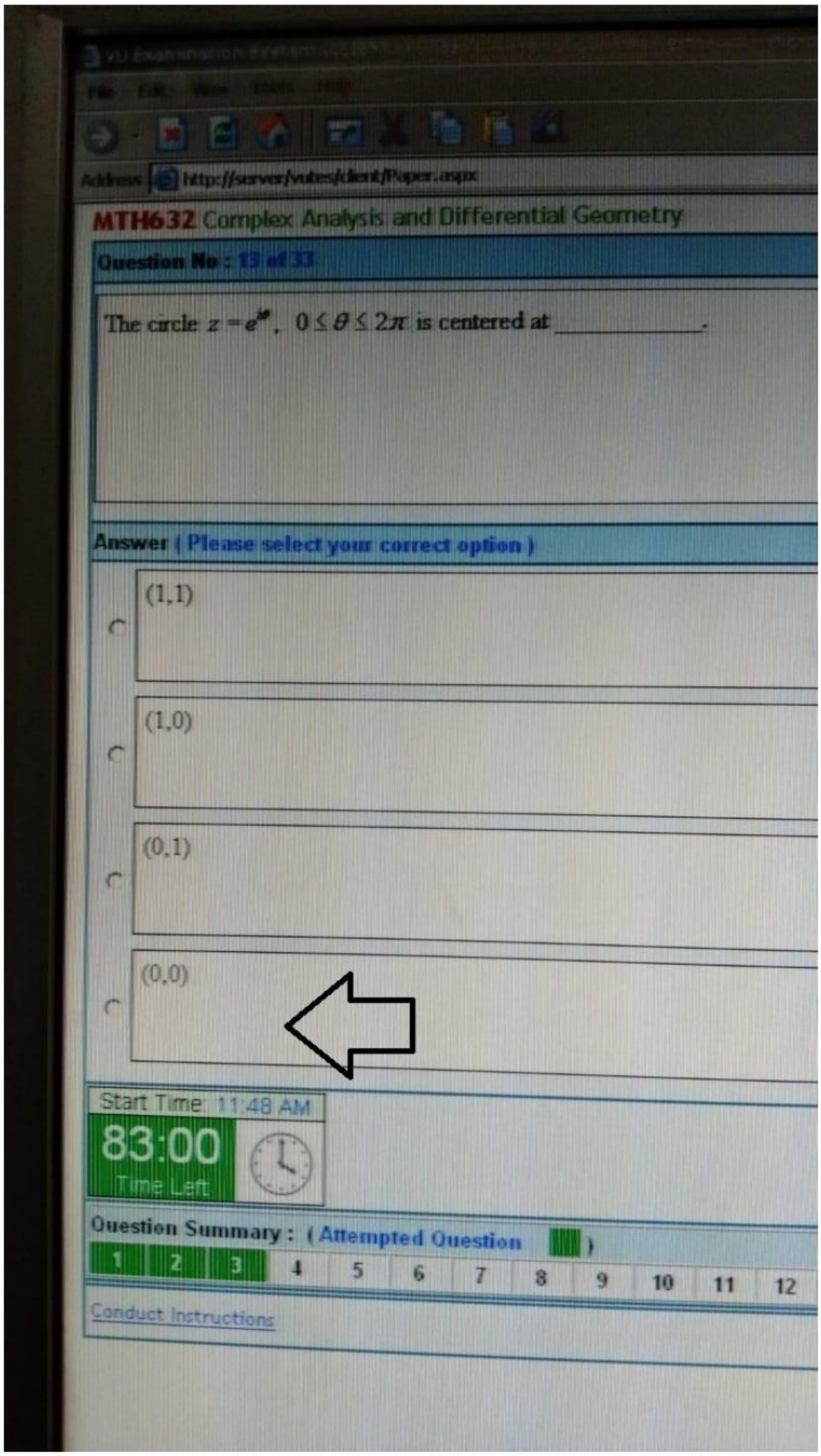
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MTH632 Complex Analysis and Differential Geometry MC1902

Question No : 14 of 33 **Marks:** 1 (Budgeted Time Min)

The definite integral of a complex valued function $w(t) = u(t) + i\,v(t)$ over an interval $a \le t \le b$ is _____, where u, v are real valued functions of a real variable t.

Answer (Please select your correct option)

- $\int_a^b w(t)dt = \int_a^b u(t)\,v(t)dt$
- $\int_a^b w(t)dt = \int_a^b u(t)dt + i\int_a^b v(t)dt$
- $\int_a^b w(t)dt = \int_a^b u(t)dt - i\int_a^b v(t)dt$
- $\int_a^b w(t)dt = \int_a^b u(t)\,v(t)dt$

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MTH632 Complex Analysis and Differential Geometry

Question No : 15 of 33

Let $f(z)=z$ be a continuous complex valued function, then $\int_0^{1+i} f(z)dz =$ _____.

Answer (Please select your correct option)

- 1-i
- 0
- 1+i
- i

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Question Summary : (Attempted Question)

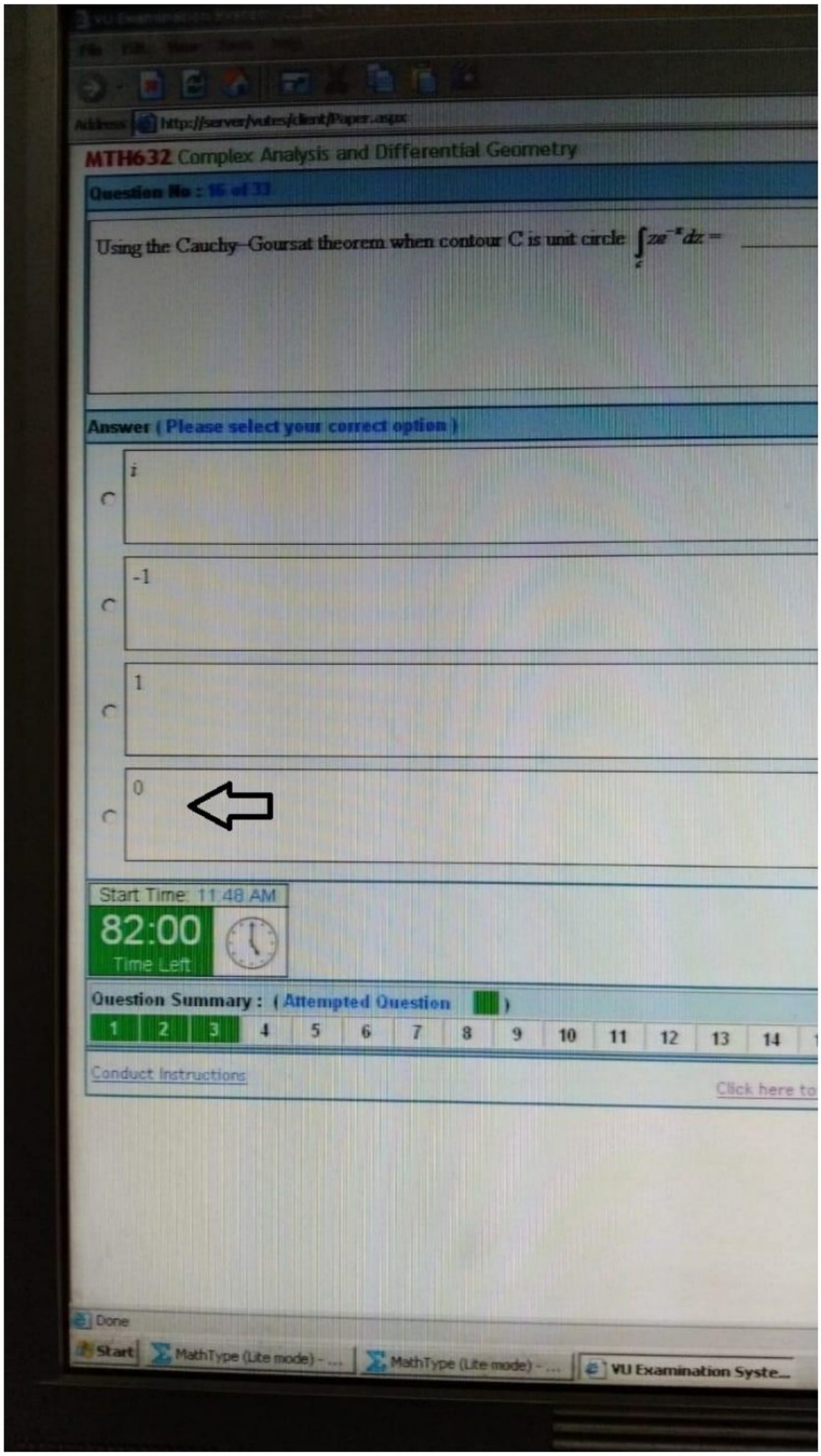
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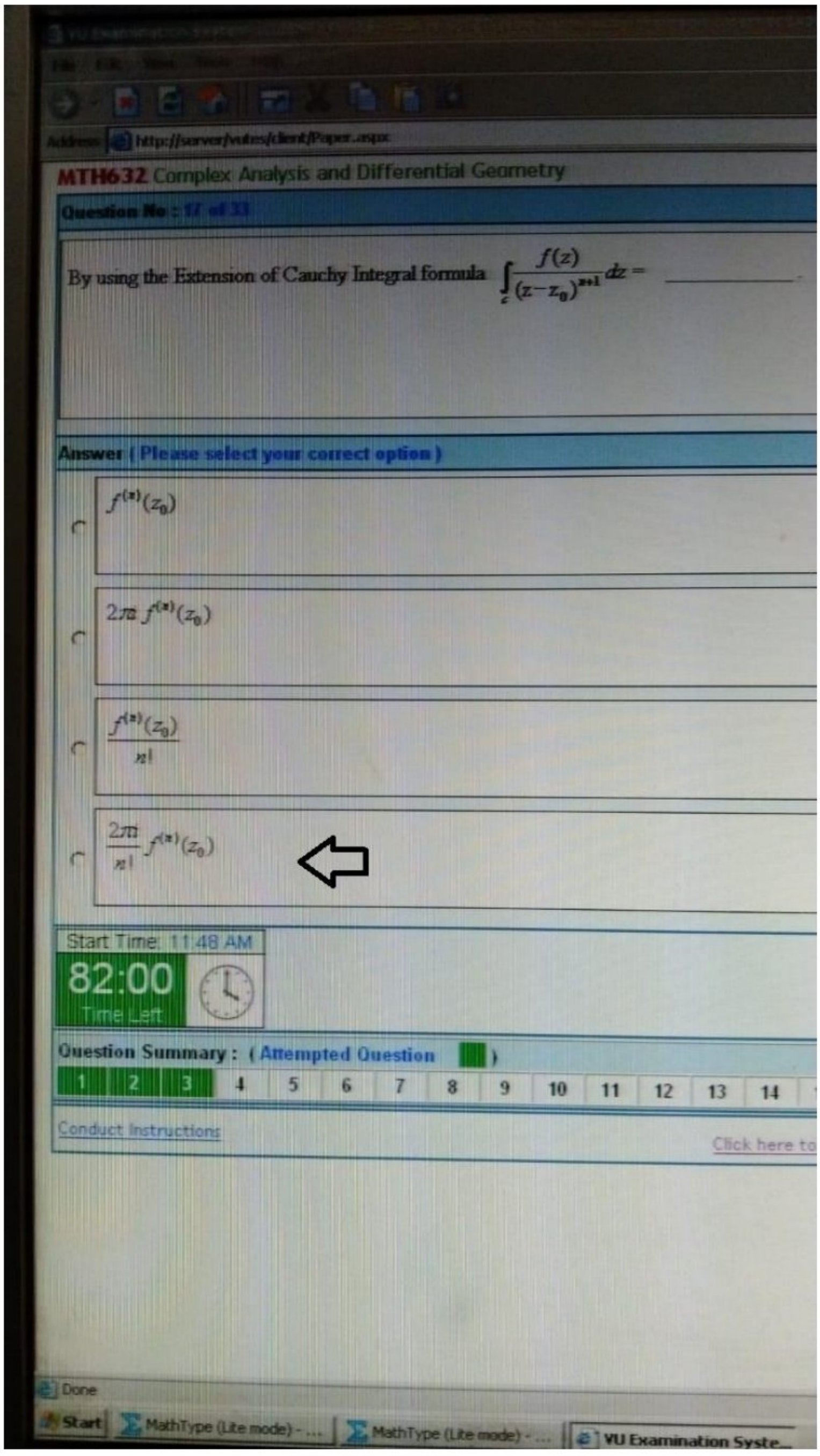
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MTH632 Complex Analysis and Differential Geometry MC1902

Question No : 14 of 33 **Marks:** 1 (Budgeted Time Min)

The definite integral of a complex valued function $w(t) = u(t) + i\,v(t)$ over an interval $a \le t \le b$ is _____, where u, v are real valued functions of a real variable t.

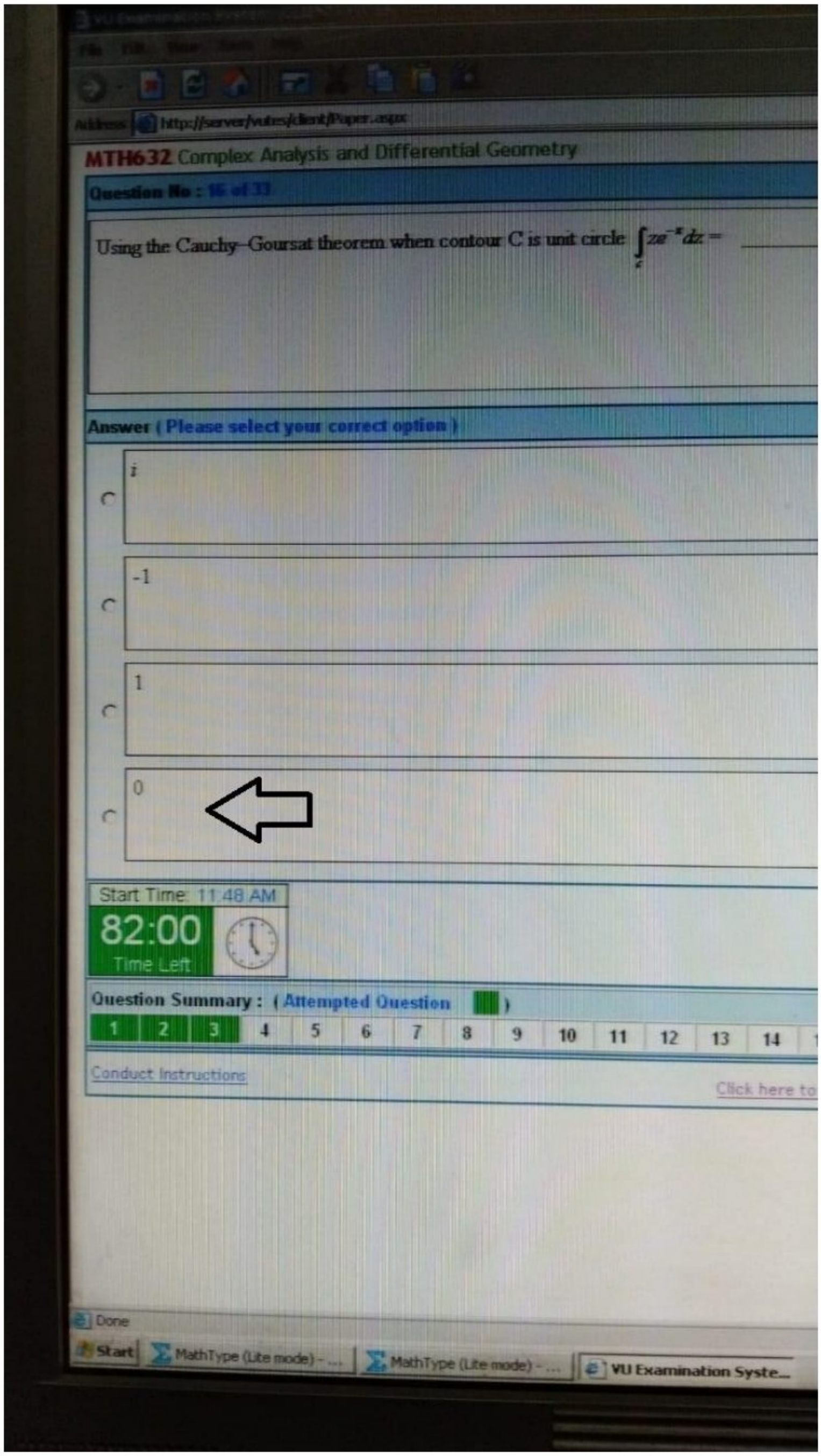
Answer (Please select your correct option)

- $\int_a^b w(t)dt = \int_a^b u(t)\,v(t)dt$
- $\int_a^b w(t)dt = \int_a^b u(t)dt + i\int_a^b v(t)dt$
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- $\int_a^b w(t)dt = \int_a^b i\ u(t)\,v(t)dt$

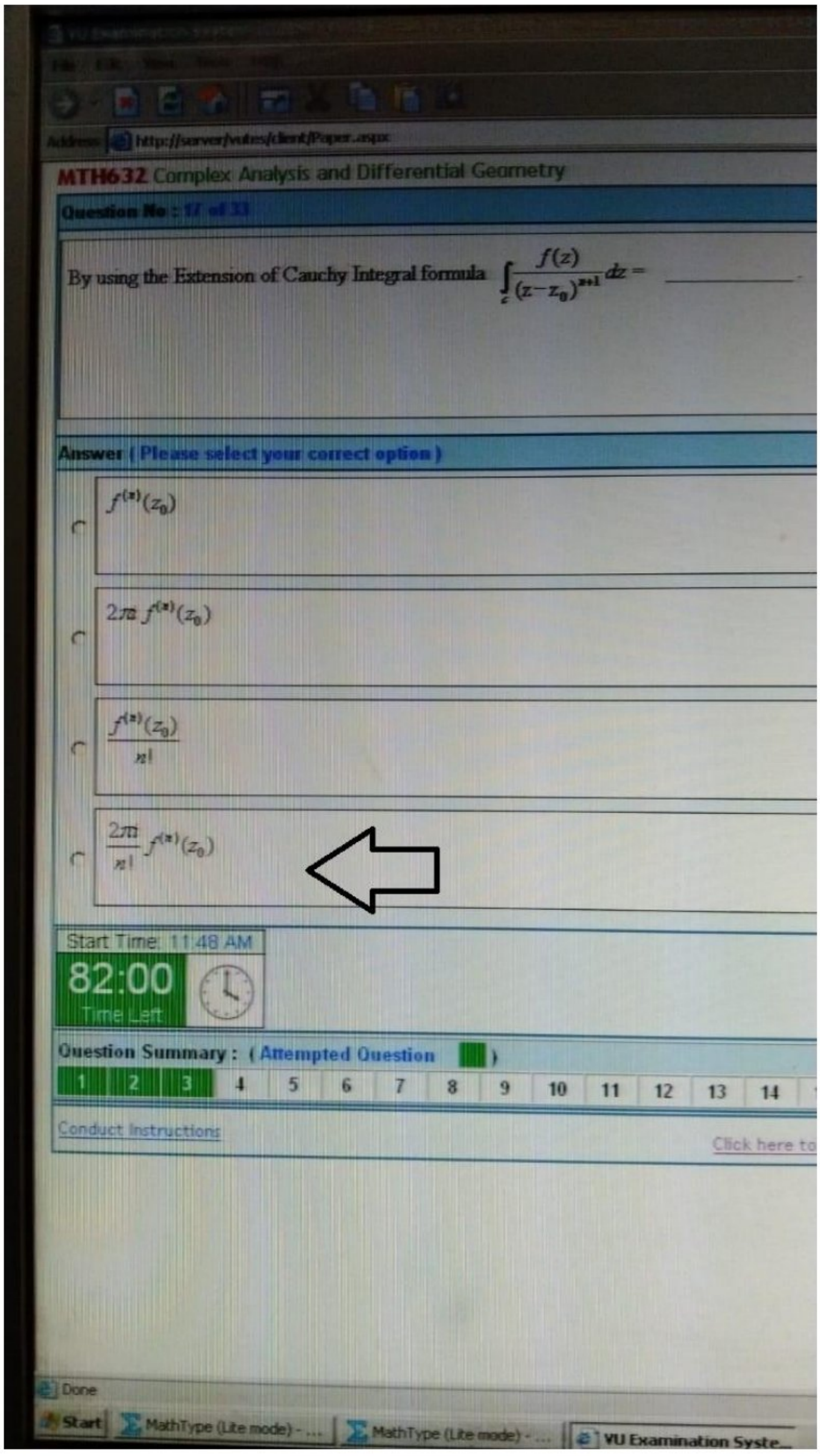
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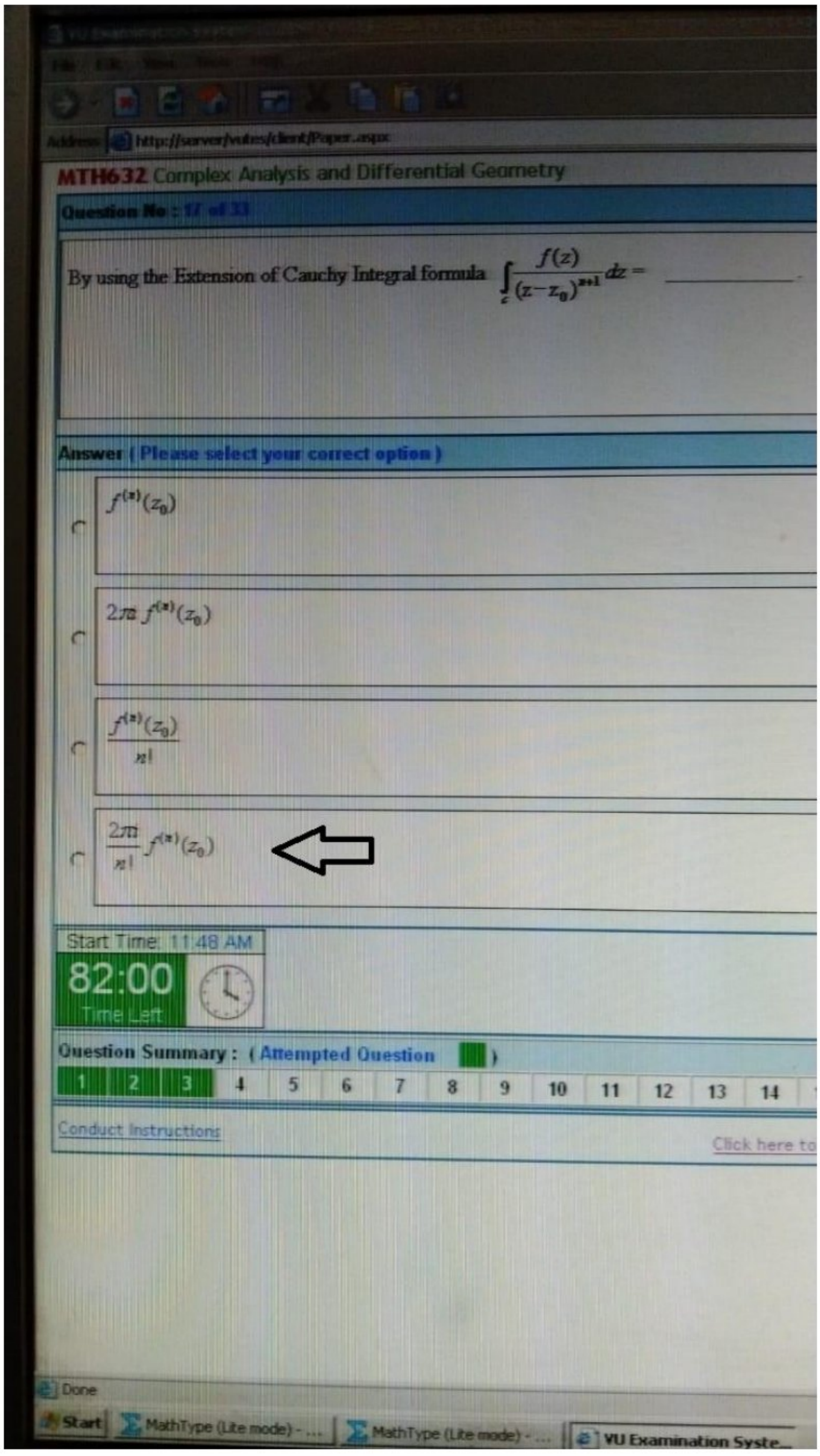
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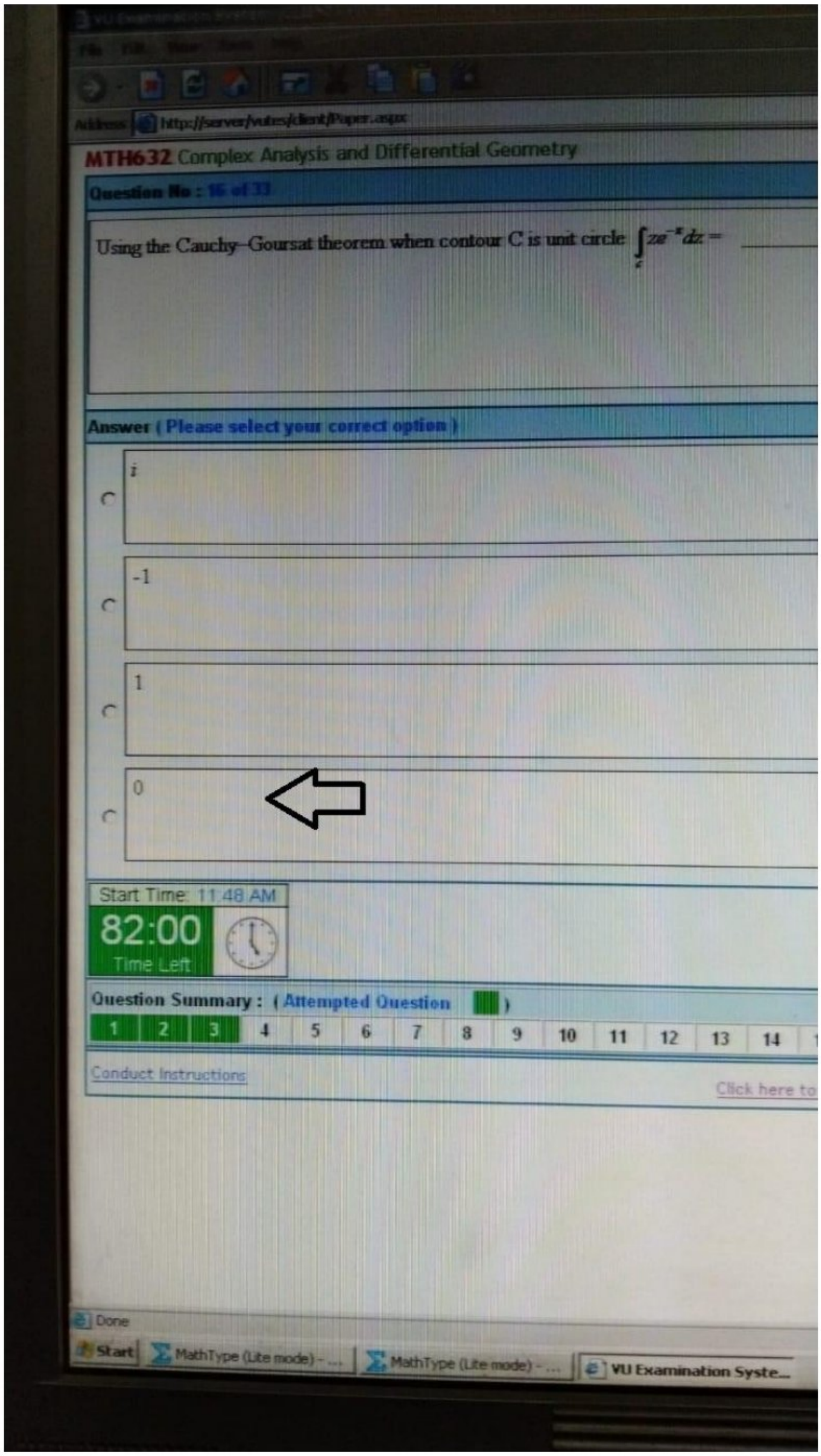
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MTH632 Complex Analysis and Differential Geometry MC1902

Question No : 14 of 33 **Marks:** 1 (Budgeted Time Min)

The definite integral of a complex valued function $w(t) = u(t) + i\,v(t)$ over an interval $a \le t \le b$ is _____, where u, v are real valued functions of a real variable t.

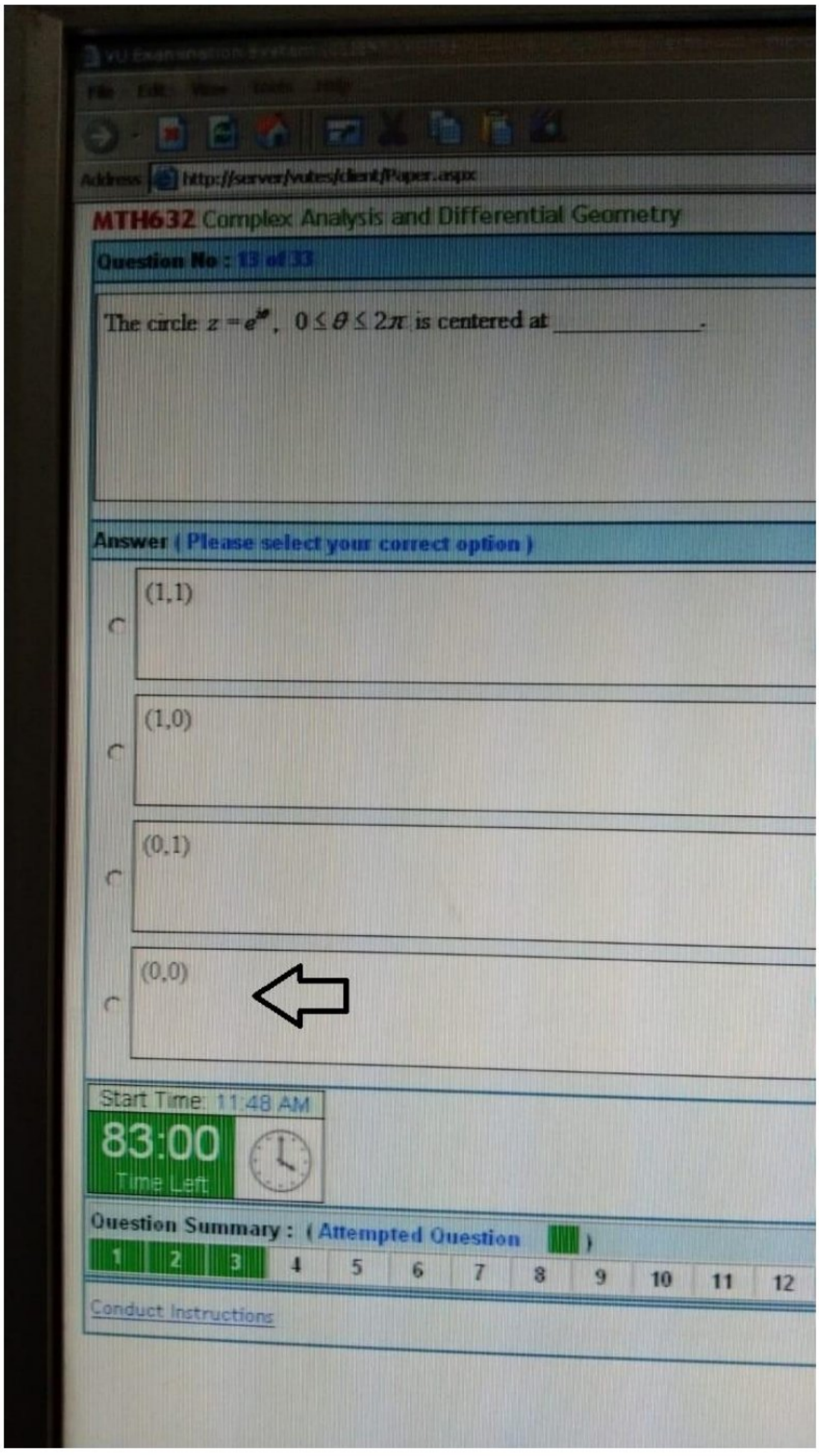
Answer (Please select your correct option)

- $\int_a^b w(t)dt = \int_a^b u(t)\,v(t)dt$
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MTH632 Complex Analysis and Differential Geometry

Question No : 12 of 55

Let Z be a complex valued function then $\sinh Z =$ _____

Answer (Please select your correct option)

- $\frac{e^{z} - e^{-z}}{2}$ ⇦
- $\frac{e^{z} + e^{-z}}{2}$
- $\frac{e^{z} - e^{-z}}{2i}$
- $\frac{e^{z} + e^{-z}}{2i}$

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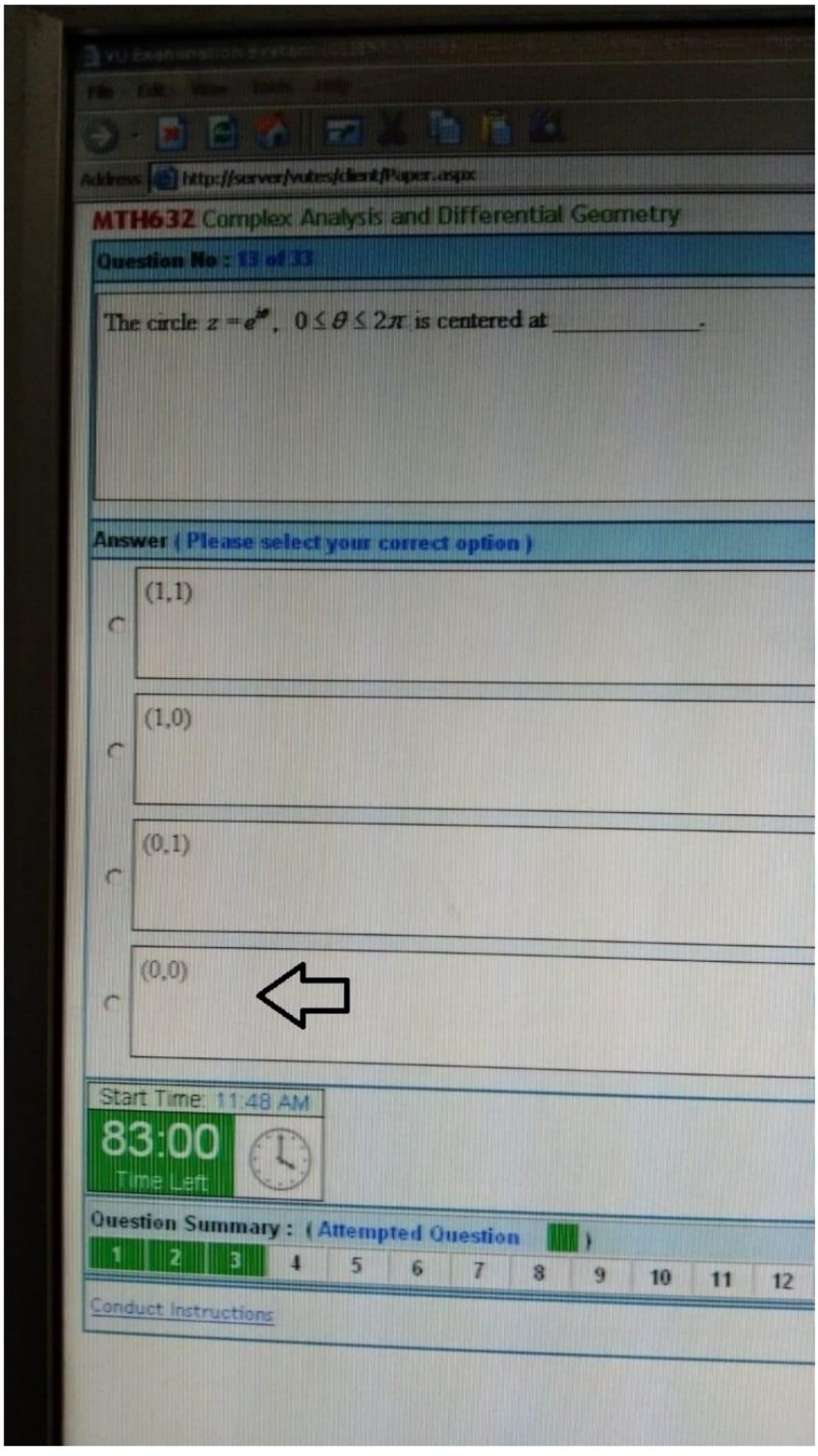
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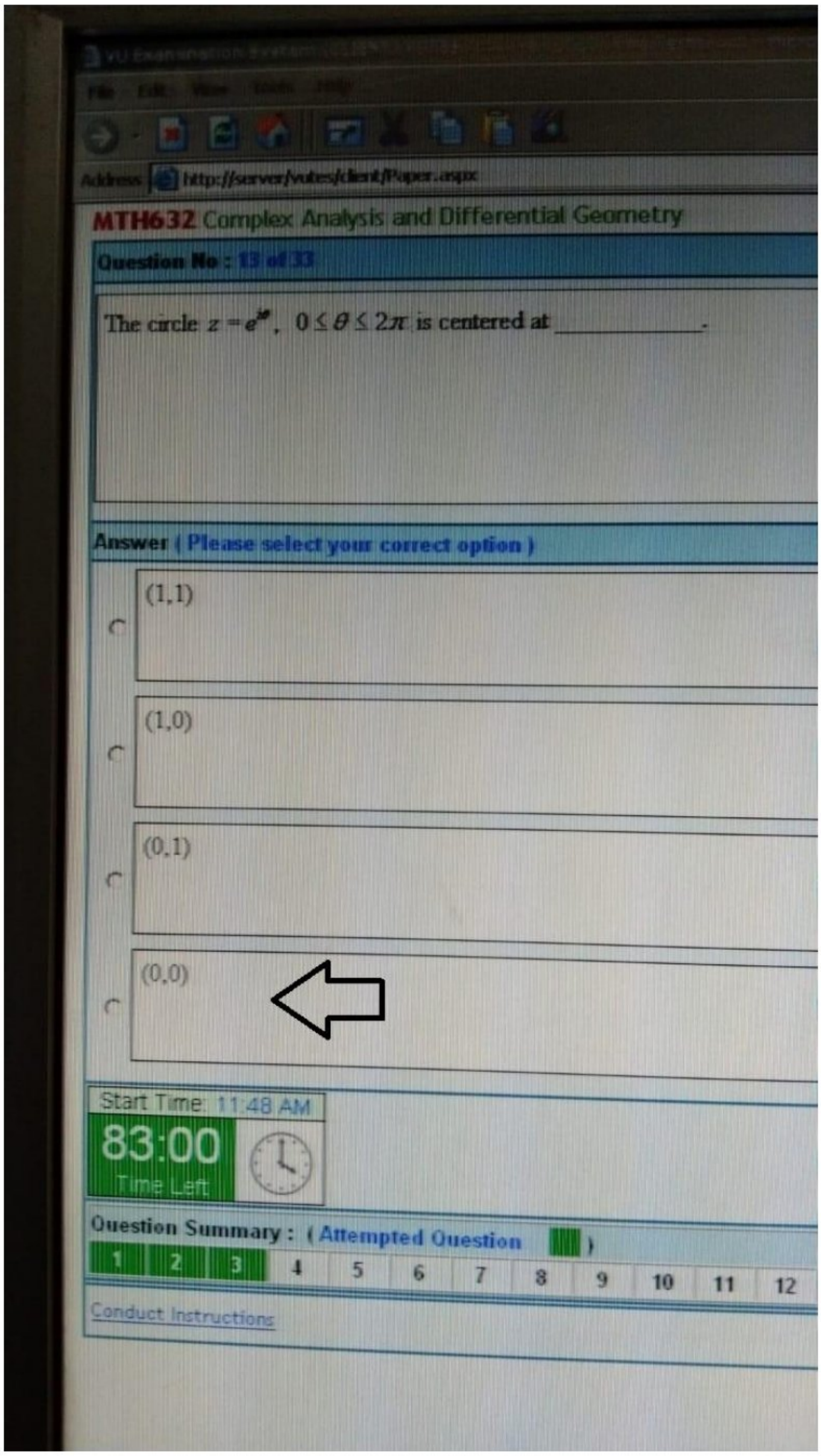
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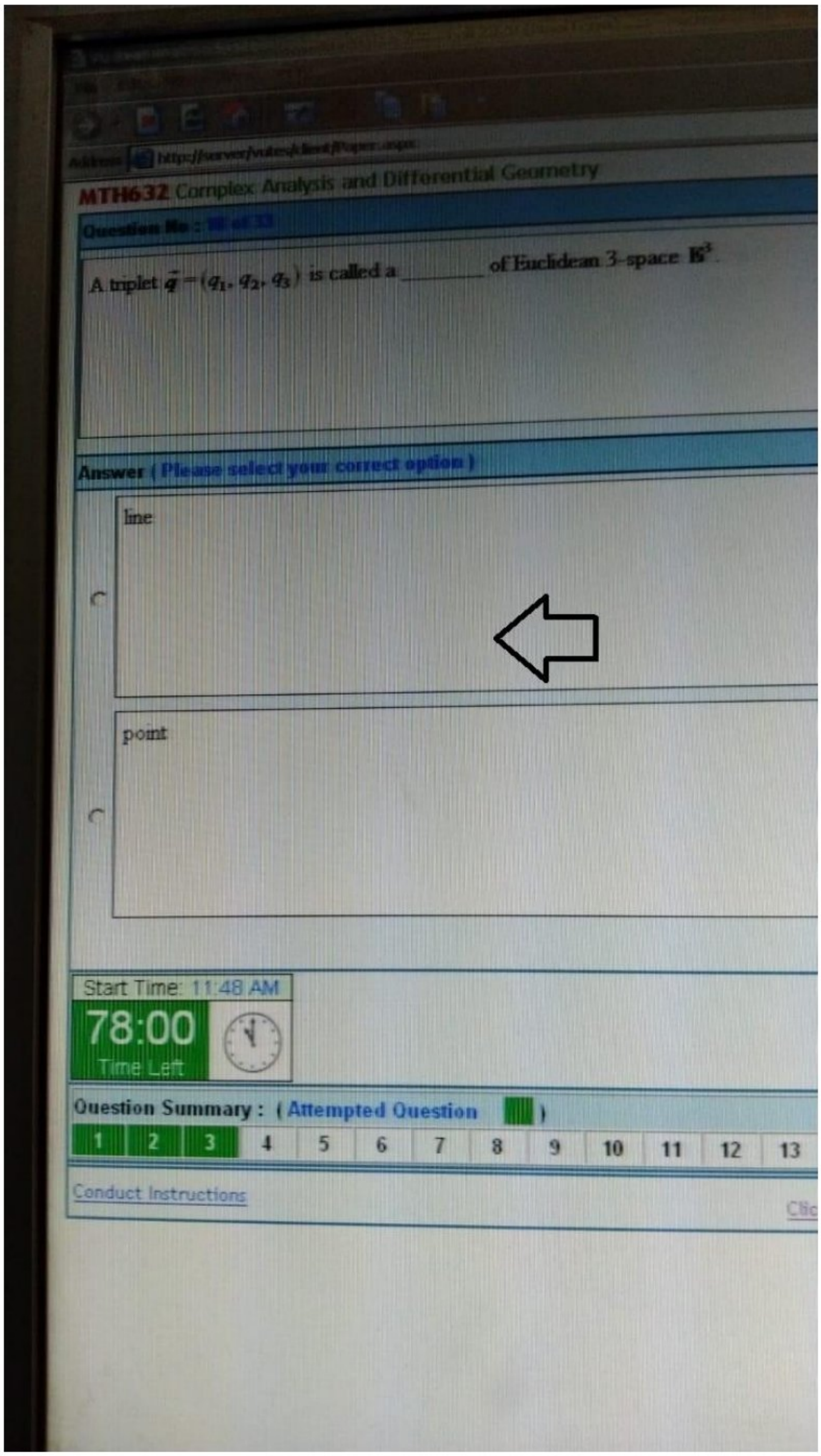
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MTH632 Complex Analysis and Differential Geometry

Question No : 19 of 33

The poles of $\frac{1}{(z^2-1)^2}$ are _____.

Answer (Please select your correct option)

- $\pm i$
- ± 1
- ± 2
- $\pm 2i$

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Question Summary : (Attempted Question ▮▮)

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MTH632 Complex Analysis and Differential Geometry

If $\vec{x}(t)$ be a smooth space curve. Then which of the following is (are) known as the the Frenet formula (formulas)?

Answer (Please select your correct option)

(a) $\vec{t}' = k\vec{n}$

(b) $\vec{n}' = \tau\vec{b} - k\vec{t}$

(c) $\vec{b}' = -\tau\vec{n}$

(d) All (a), (b) and (c)

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Question Summary : (Attempted Question)

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MTH632 Complex Analysis and Differential Geometry

If the three vectors $\vec{t}$, $\vec{n}$ and $\vec{b}$ are perpendicular to each other and form the Frenet frame, then $\vec{b} \times \vec{t} =$

Answer (Please select your correct option)

- $\vec{b}$
- $\vec{t}$
- $\vec{n}$
- $-\vec{n}$

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Question Summary : (Attempted Question)

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MTH632 Complex Analysis and Differential Geometry

Question No :

Let ϕ and ψ be two 1-forms then their sum is defined as _____ for all tangent vectors v.

Answer (Please select your correct option)

- $(\phi+\psi)(v)$
- $(\phi+\psi)(v)=(\psi)(v)$
- $(\phi+\psi)(v)=(\phi)(v)+(\psi)(v)$
- $(\phi+\psi)(v)=(\phi)(v)$

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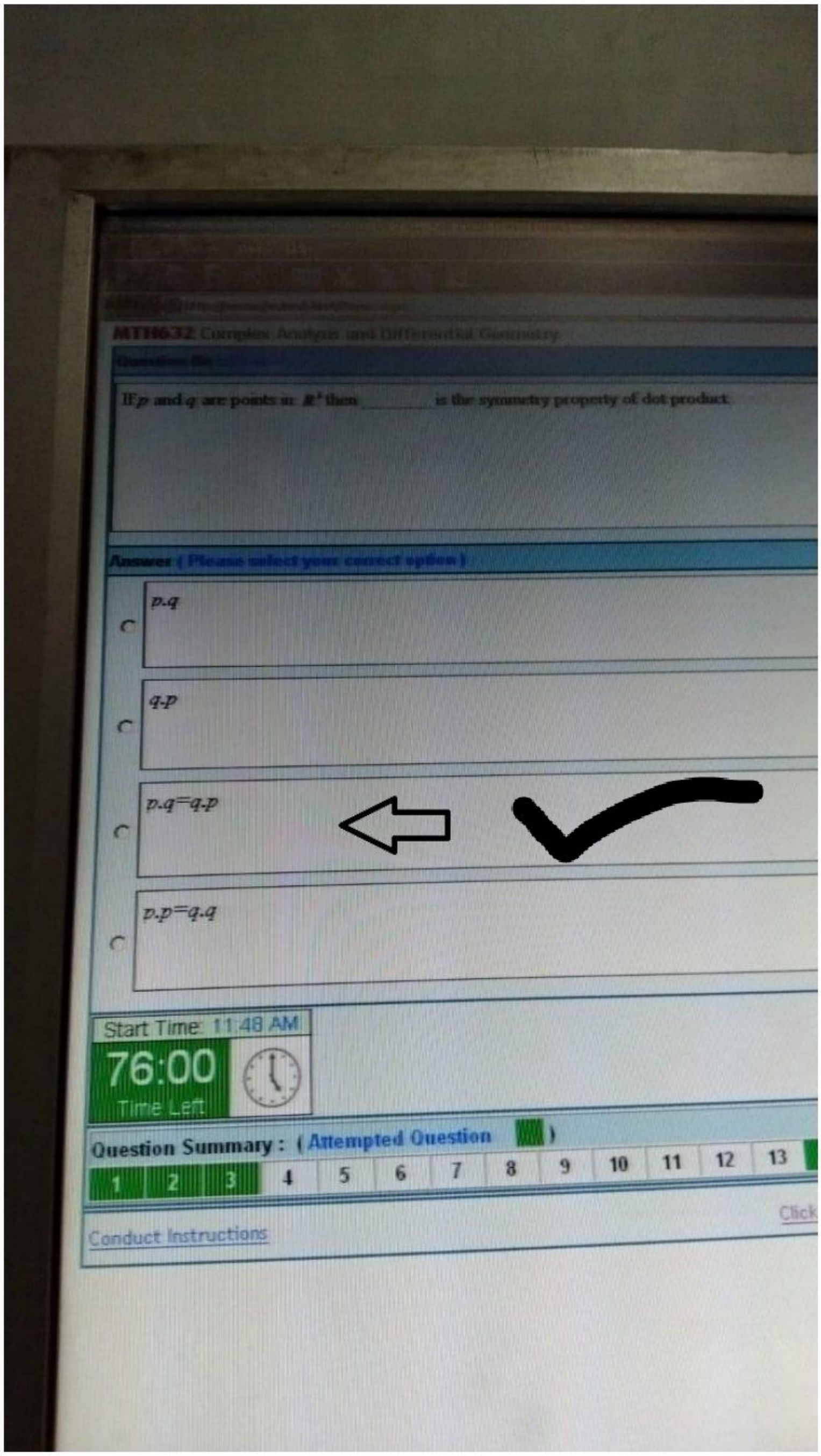
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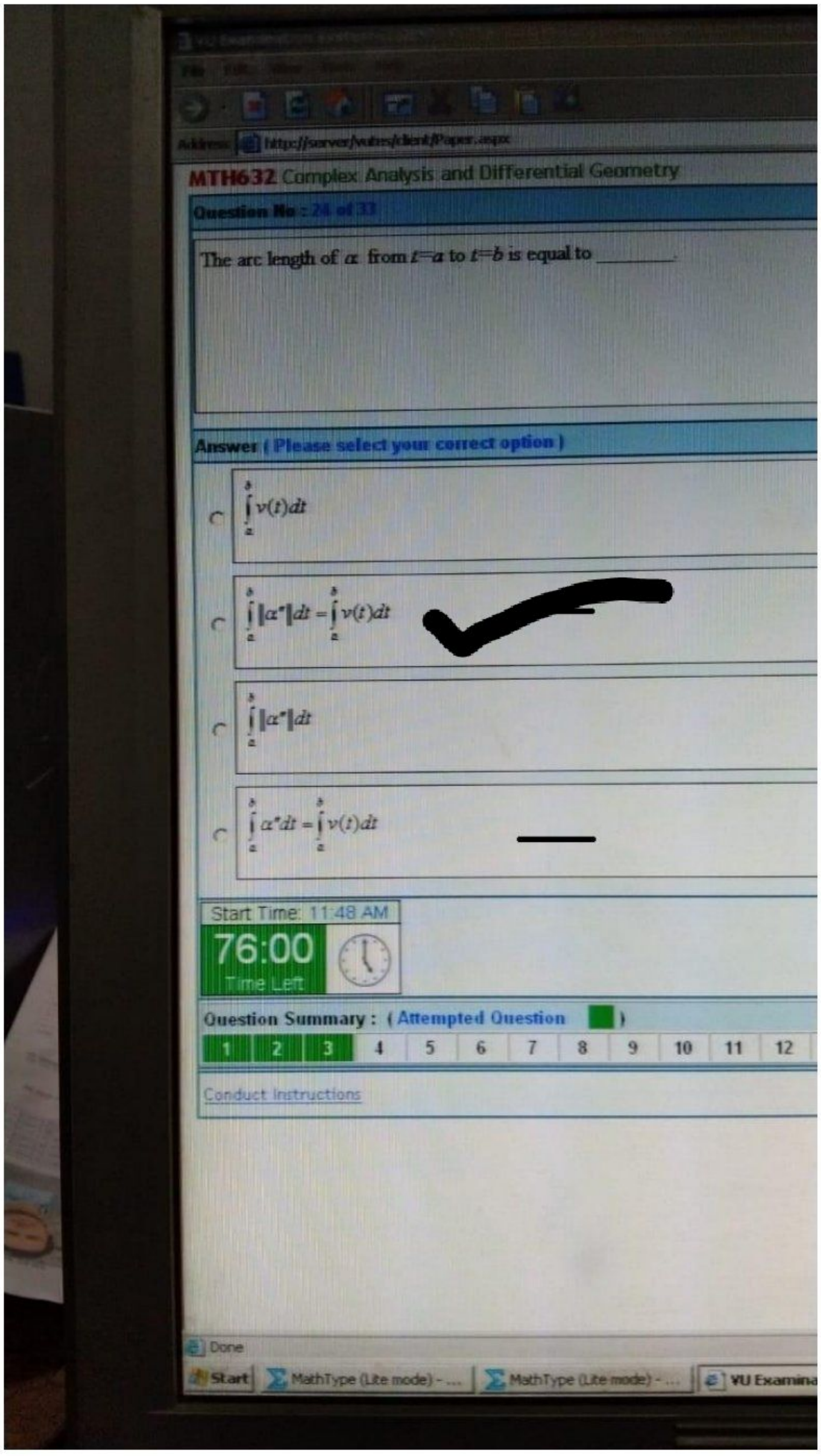
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MTH632: Complex Analysis and Differential Geometry

Let $\beta : I \to \mathbb{R}^3$ be a unit speed curve. The velocity $T = \beta'$, is said to be the _____ on β.

Answer (Please select your correct option)

- unit
- unit tangent vector field
- vector
- tangent

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Question Summary : (Attempted Question)

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Question Summary : (Attempted Question)

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MTH632 Complex Analysis and Differential Geometry

Question No : 24 of 33

The arc length of α from $t=a$ to $t=b$ is equal to _____.

Answer (Please select your correct option)

- $\int_a^b v(t)dt$
- $\int_a^b \|\alpha''\|dt = \int_a^b v(t)dt$ ⟸
- $\int_a^b \|\alpha''\|dt$
- $\int_a^b \alpha''dt = \int_a^b v(t)dt$

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Question Summary : (Attempted Question)

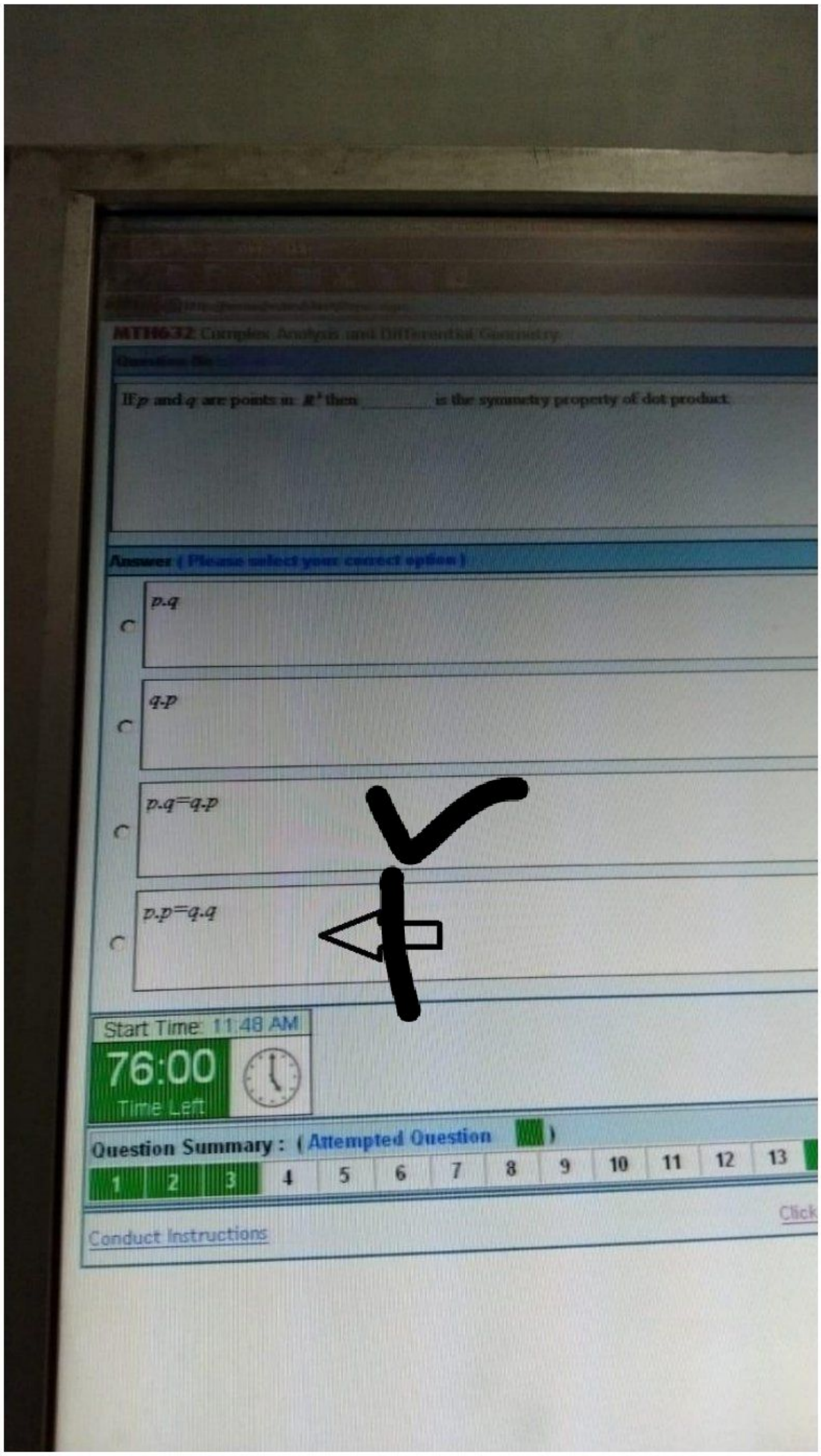
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MTH632 Complex Analysis and Differential Geometry

Question No :

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Question Summary : (Attempted Question)

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MTH632 Complex Analysis and Differential Geometry

If the three vectors $\vec{t}$, $\vec{n}$ and $\vec{b}$ are perpendicular to each other and form the Frenet frame, then $\vec{b} \times \vec{t} =$

Answer (Please select your correct option)

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- $\vec{t}$
- $\vec{n}$
- $-\vec{n}$

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Question Summary : (Attempted Question)

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MTH632 Complex Analysis and Differential Geometry

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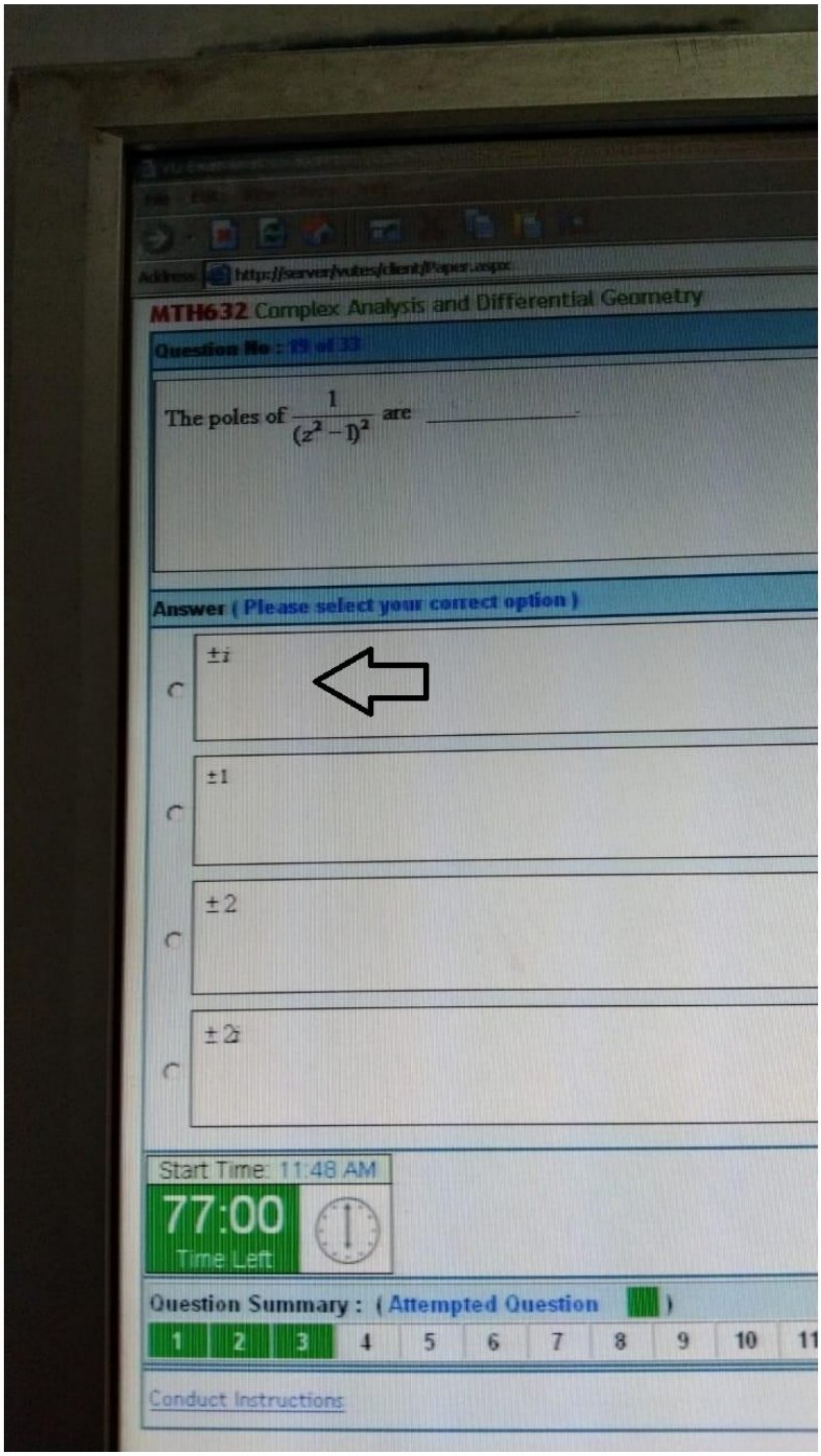
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MTH632 Complex Analysis and Differential Geometry

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MTH632 Complex Analysis and Differential Geometry

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Question Summary : (Attempted Question)

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MTH632 Complex Analysis and Differential Geometry

Question No : 24 of 33

The arc length of α from $t=a$ to $t=b$ is equal to _____.

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- $\int_a^b \|\alpha''\|dt = \int_a^b v(t)dt$ ⇦
- $\int_a^b \|\alpha''\|dt$
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Question Summary : (Attempted Question)

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MTH632: Complex Analysis and Differential Geometry

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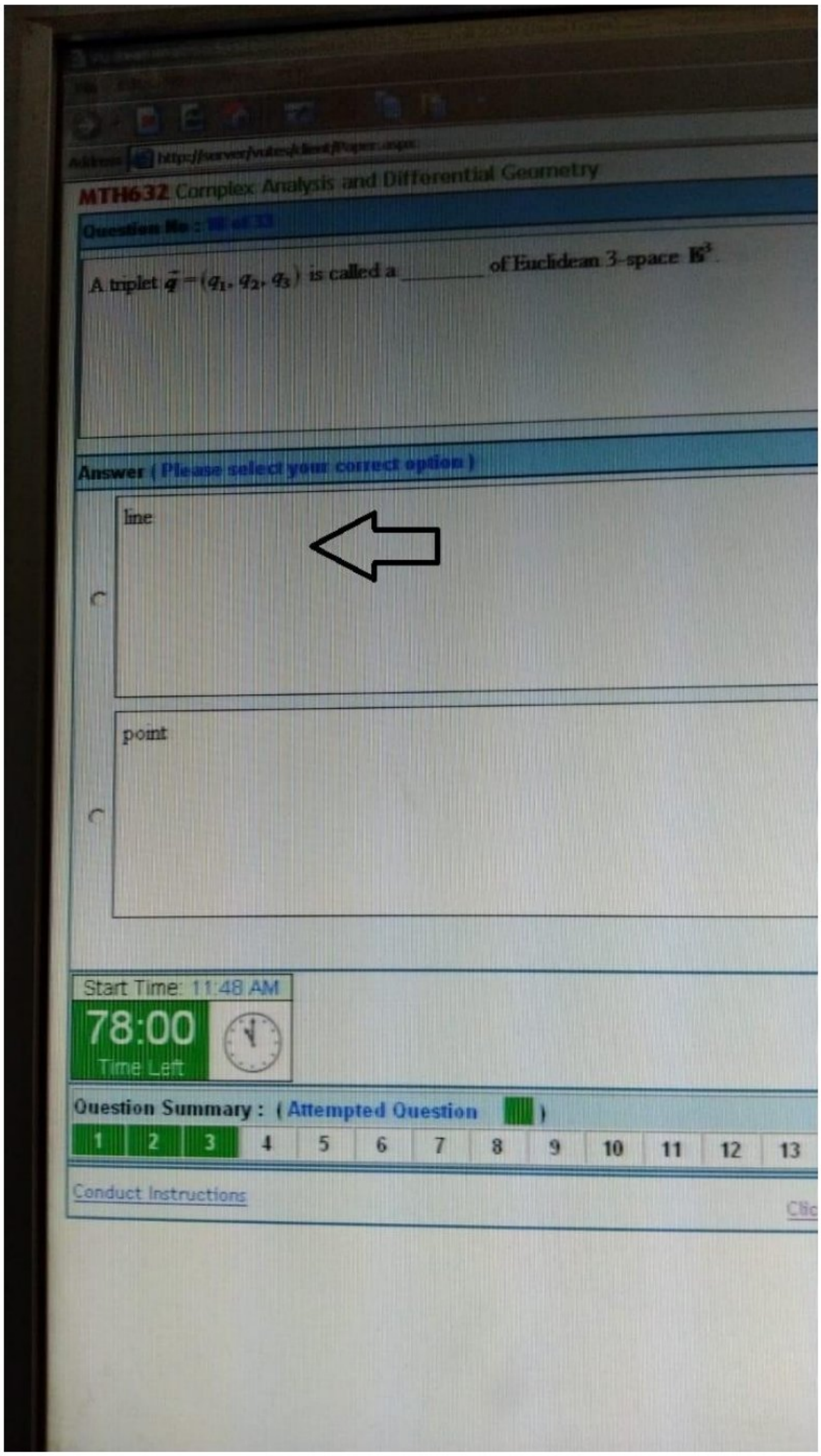
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Time Left

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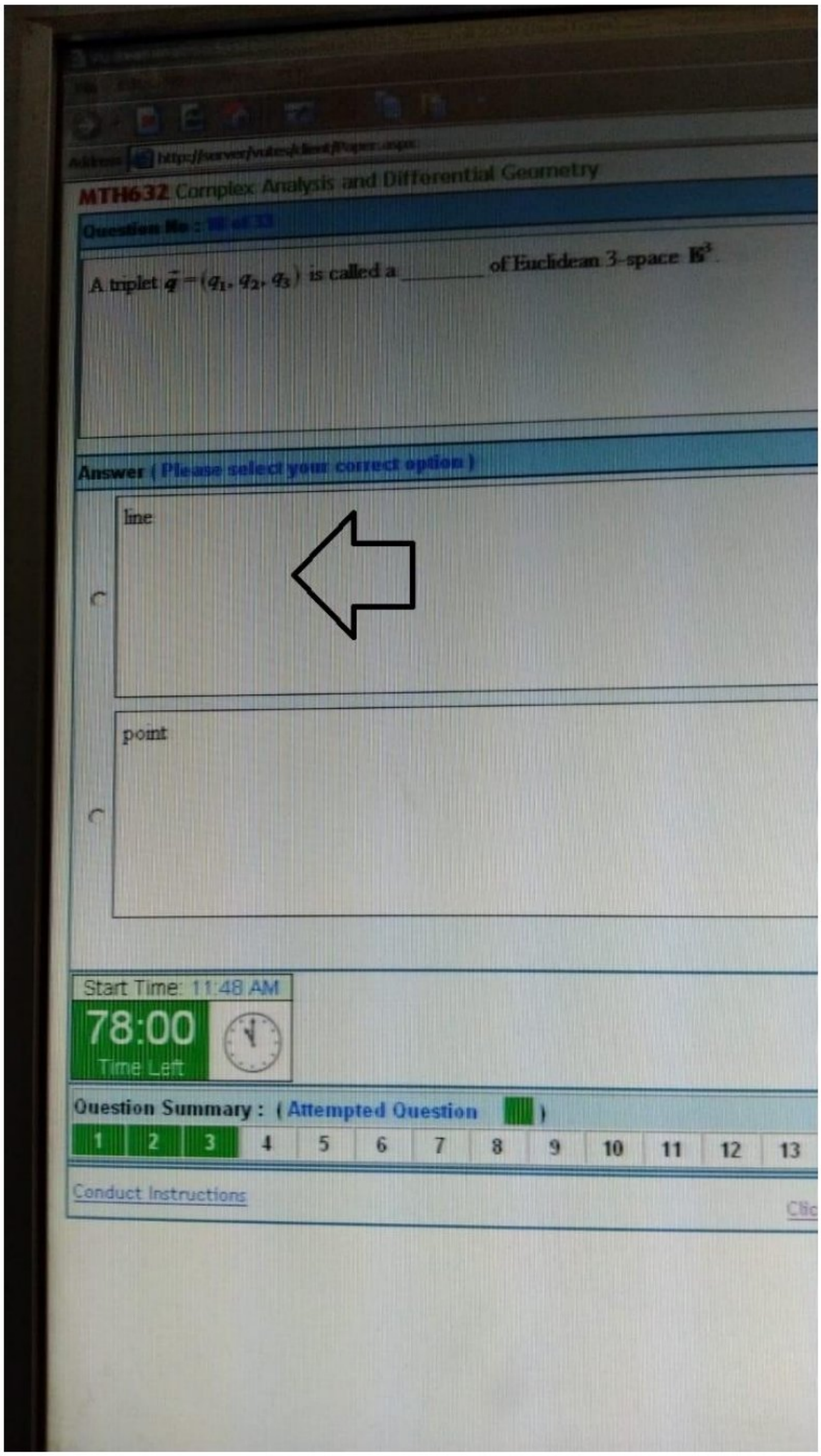
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Conduct Instructions

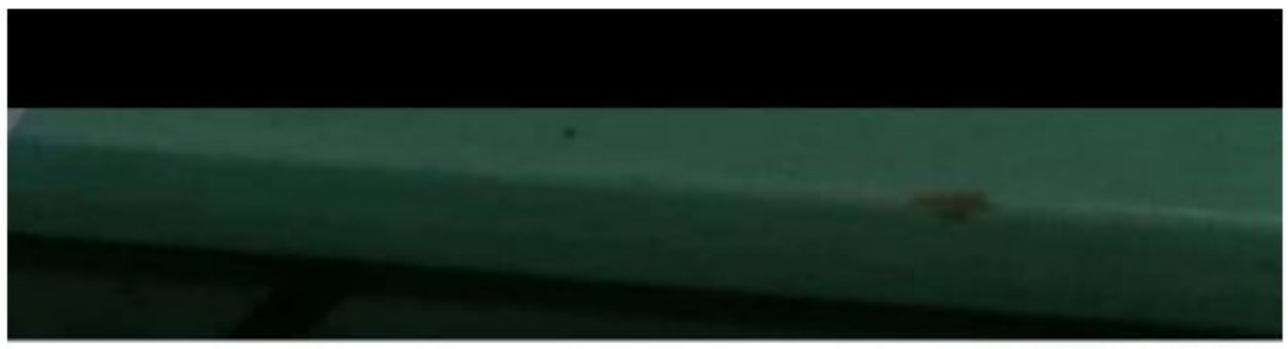
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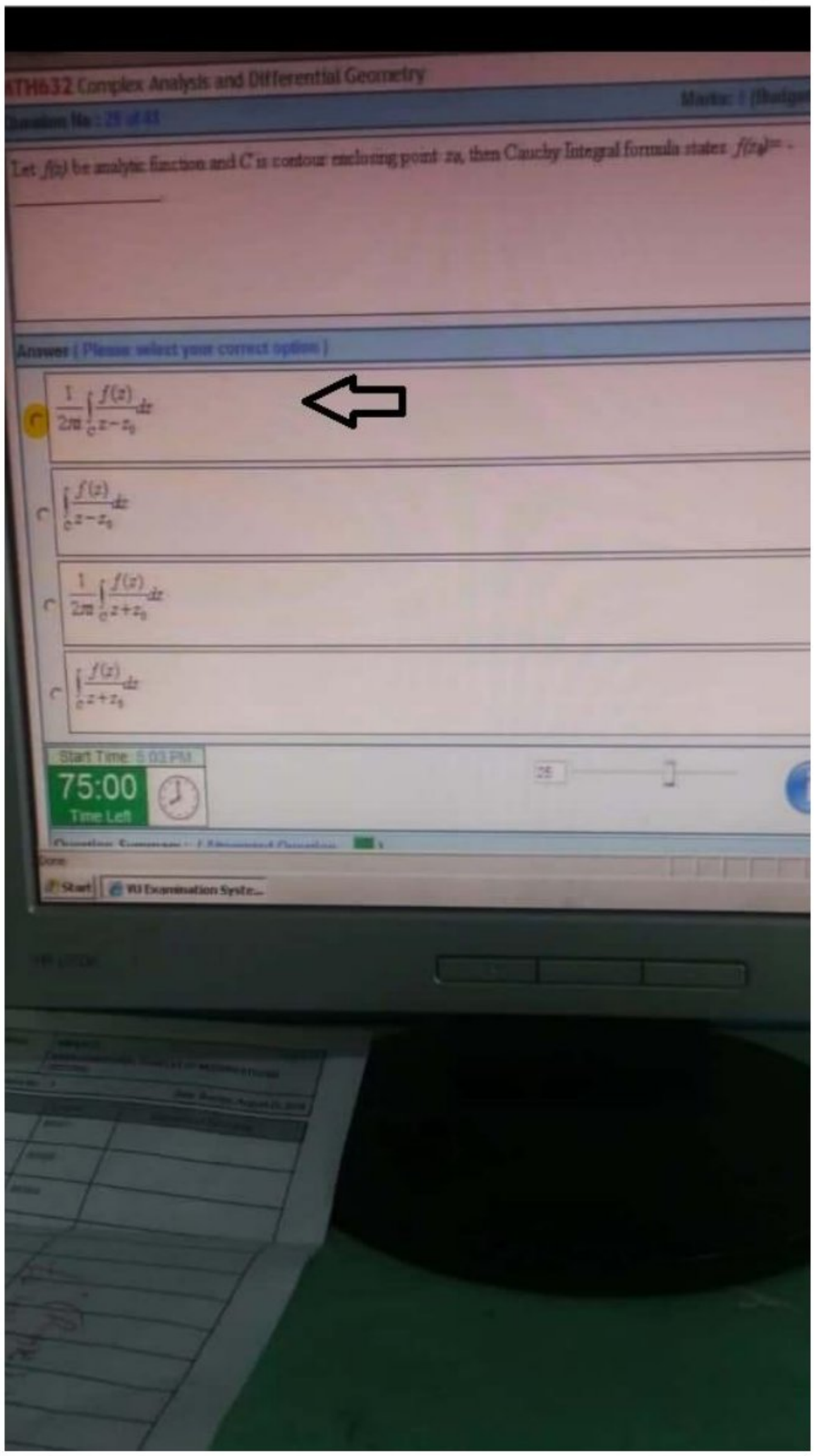
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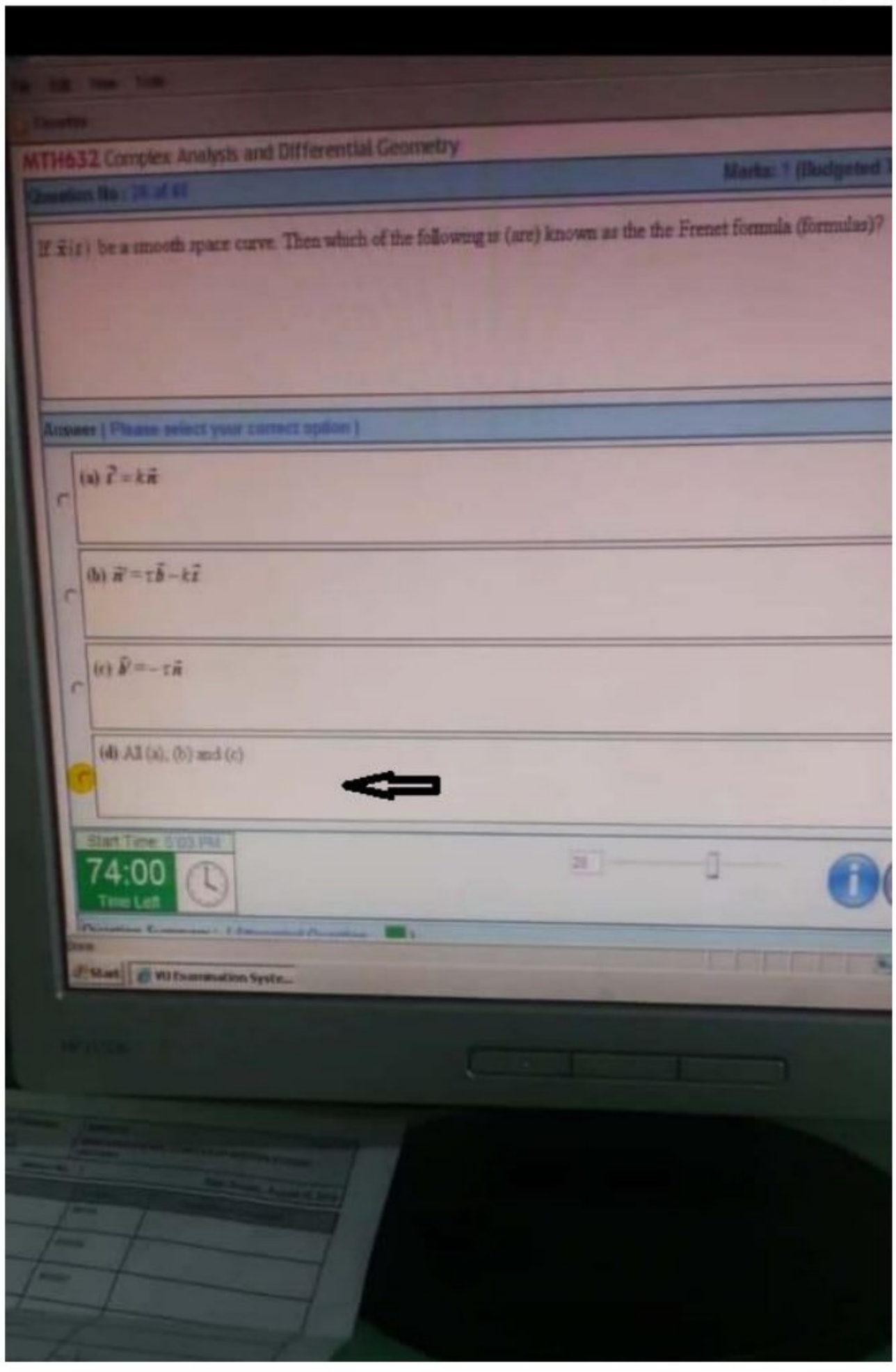
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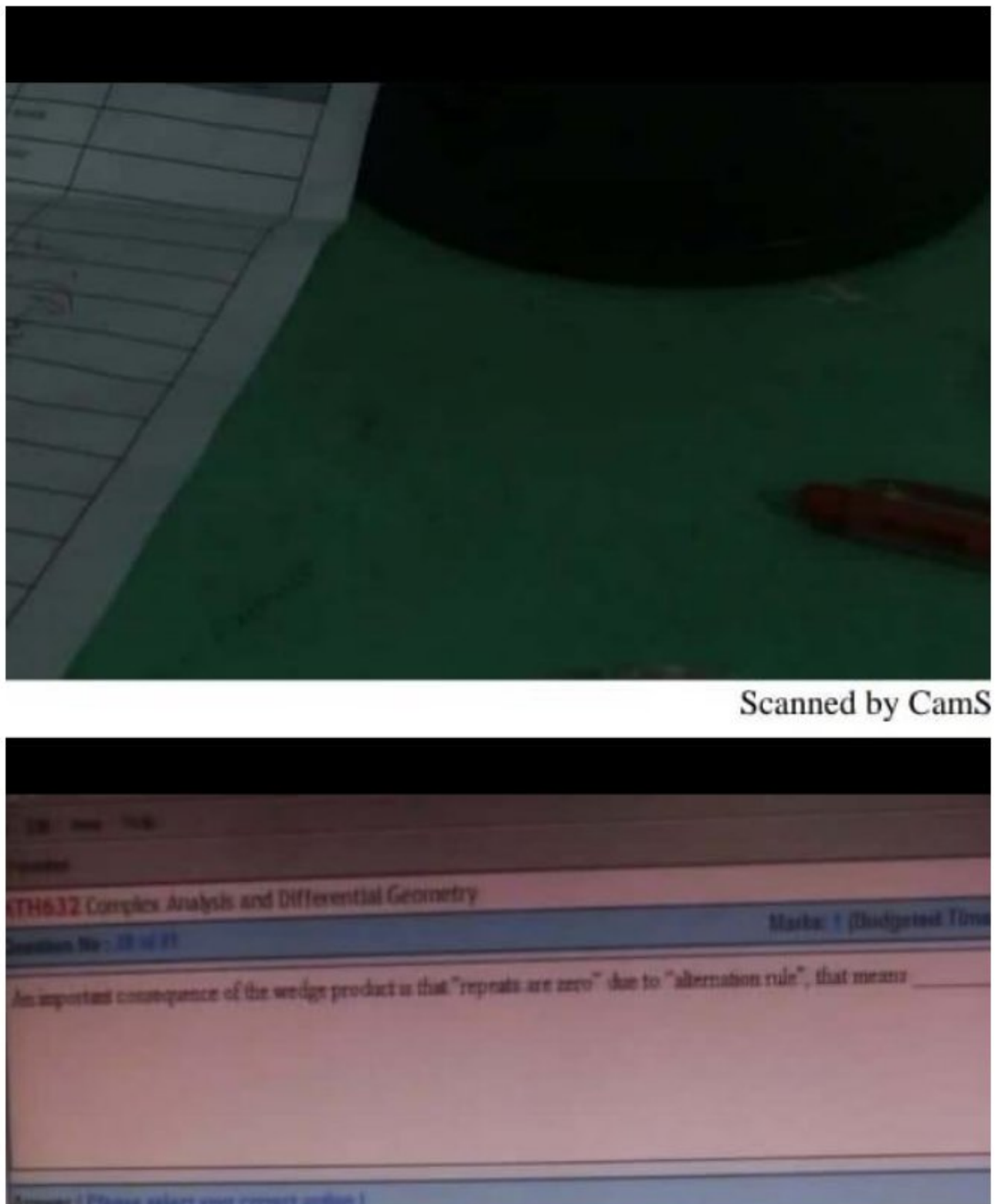
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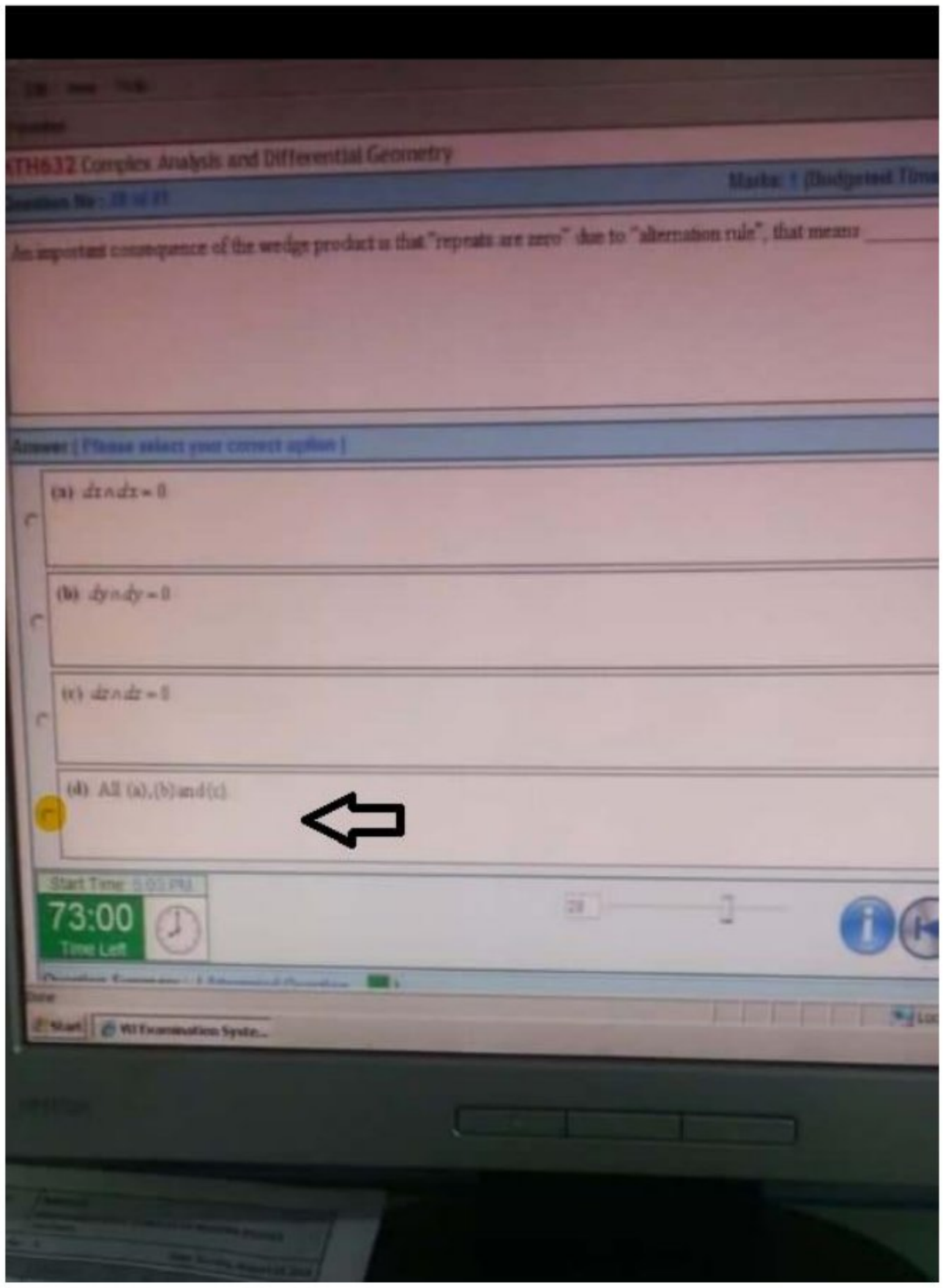
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TH632 Complex Analysis and Differential Geometry

If the three vectors $\vec{t}$, $\vec{n}$ and $\vec{b}$ are perpendicular to each other and form the Frenet frame, then $\vec{b} \times \vec{t} =$ _____

Answer (Please select your correct option)

- $\vec{b}$
- $\vec{t}$
- $\vec{n}$
- $-\vec{n}$

Start Time: 5:03 PM

73:00

Time Left

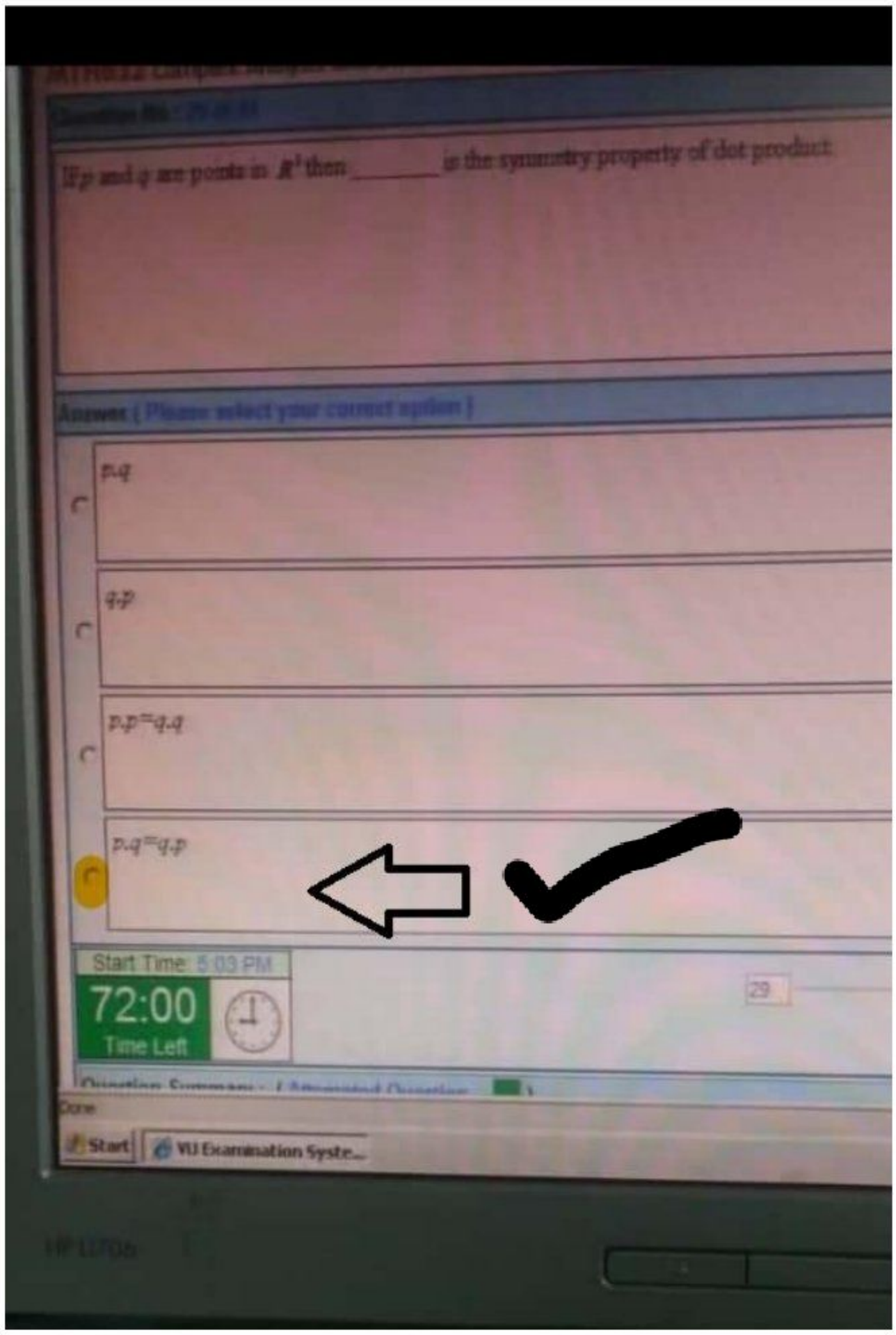
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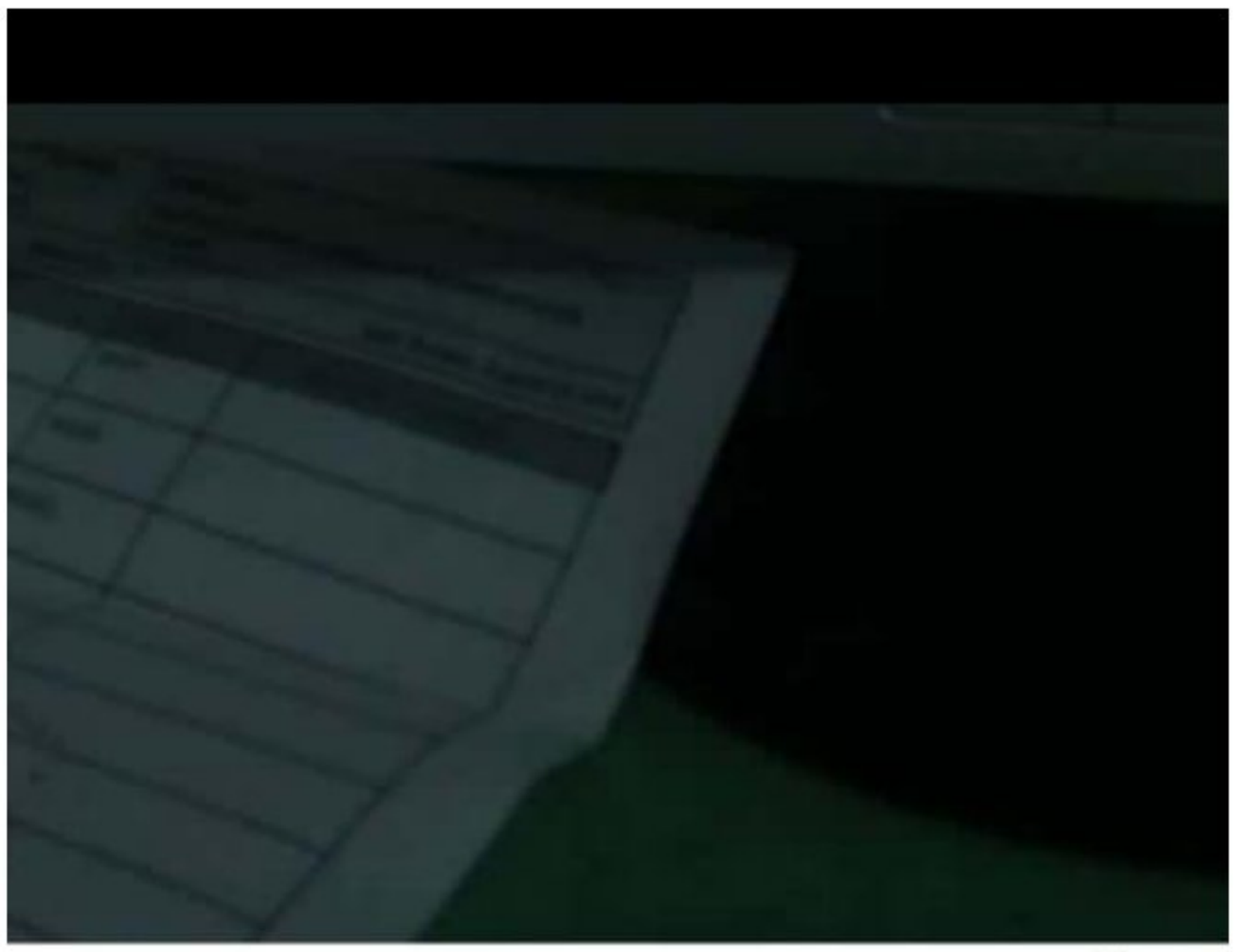
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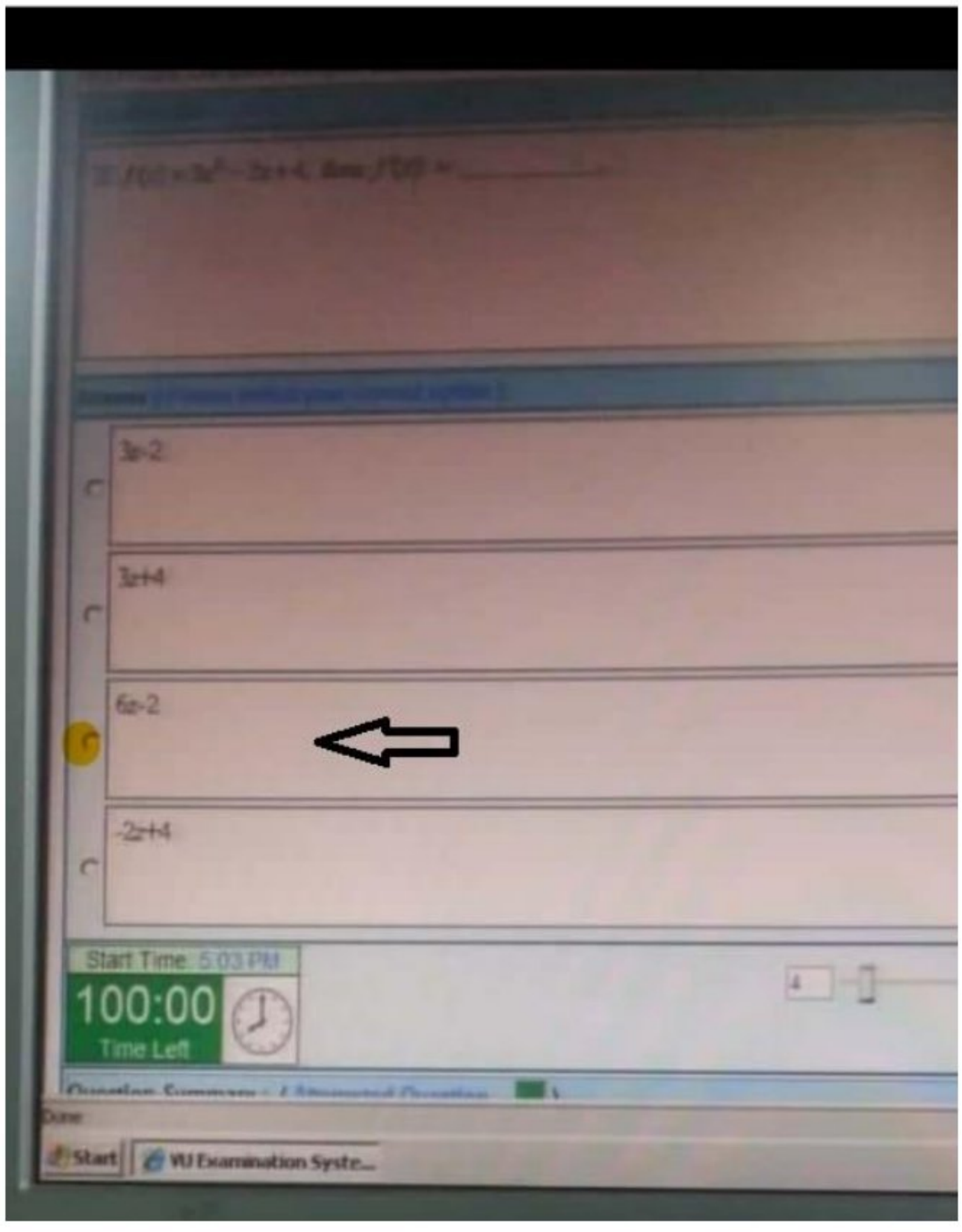
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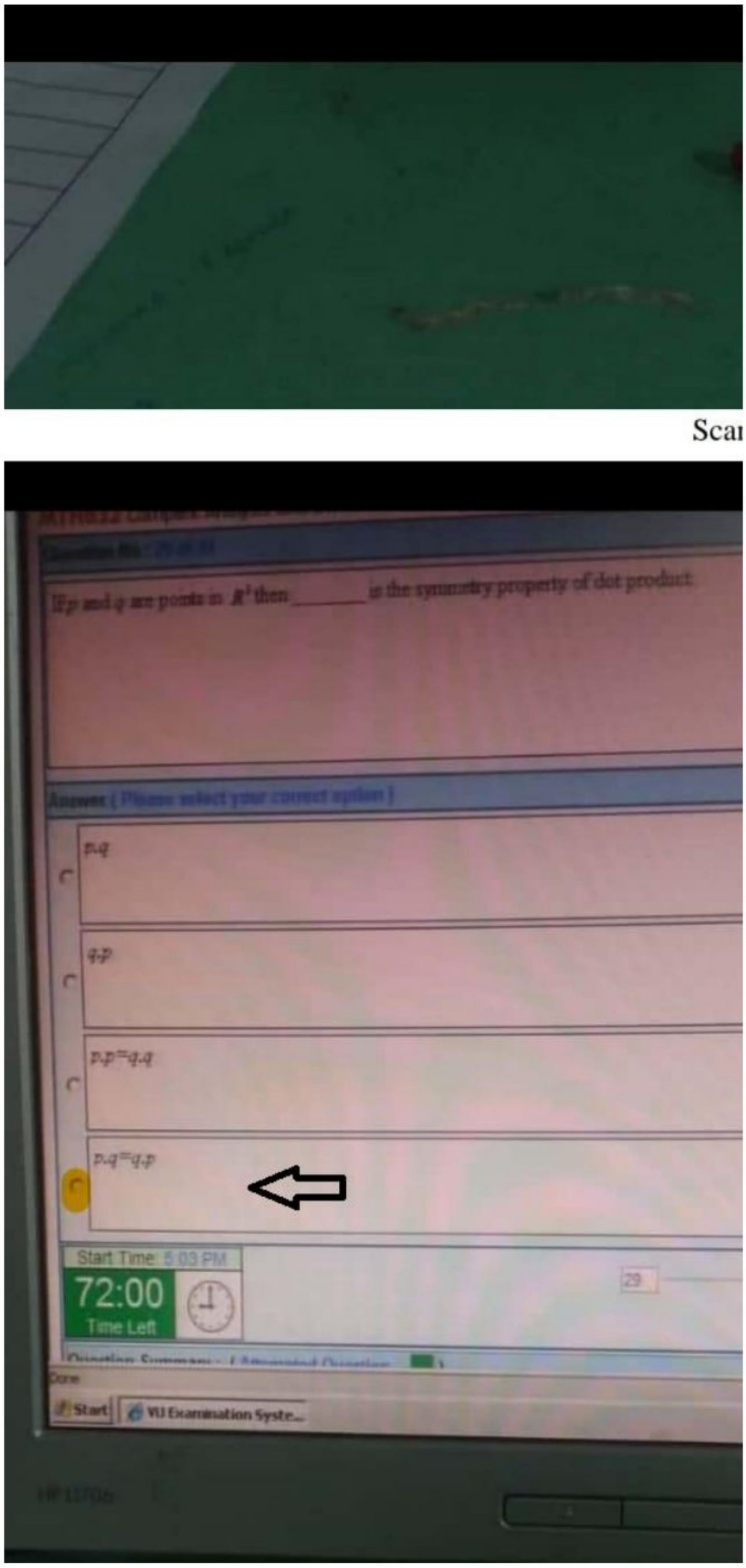
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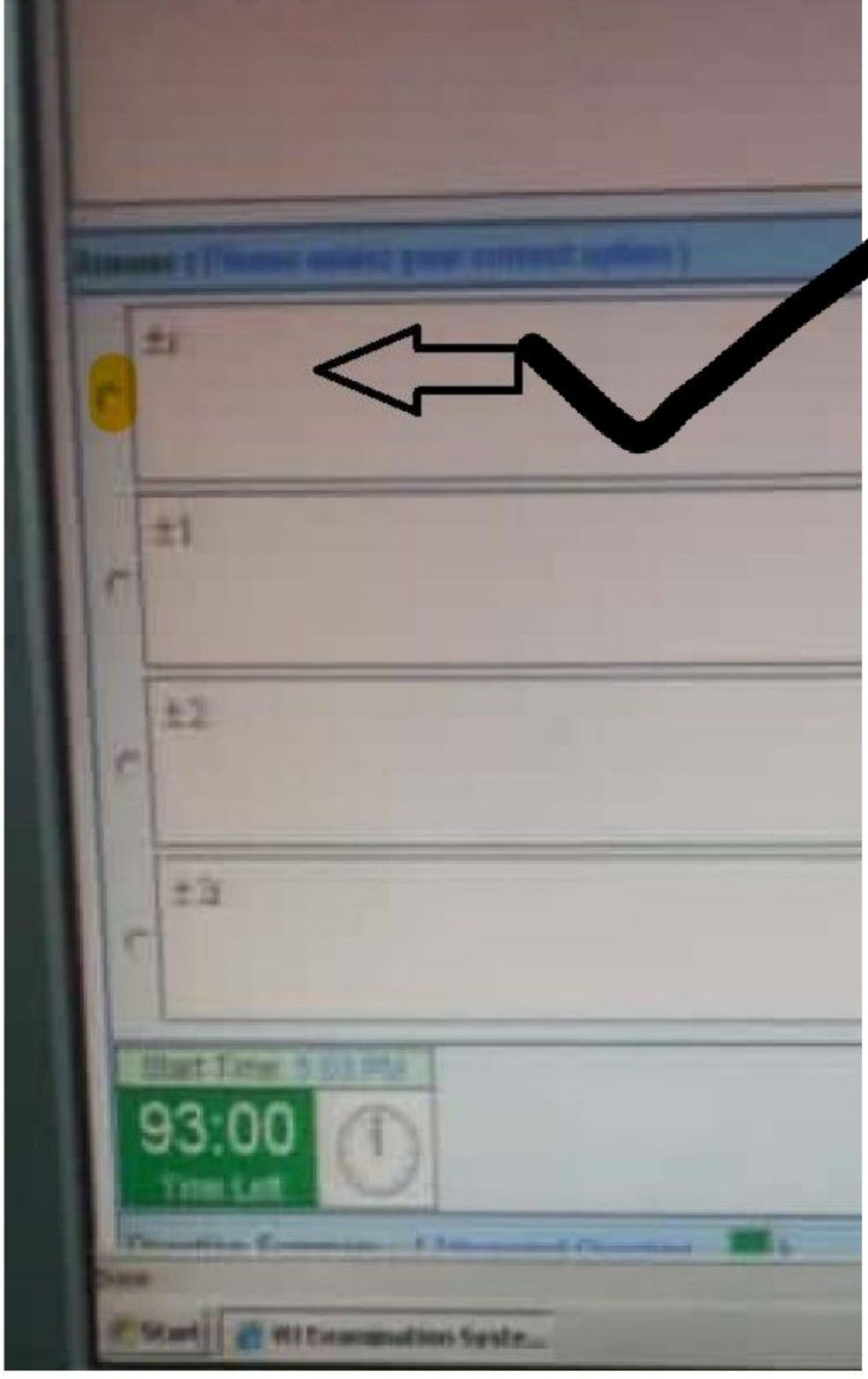
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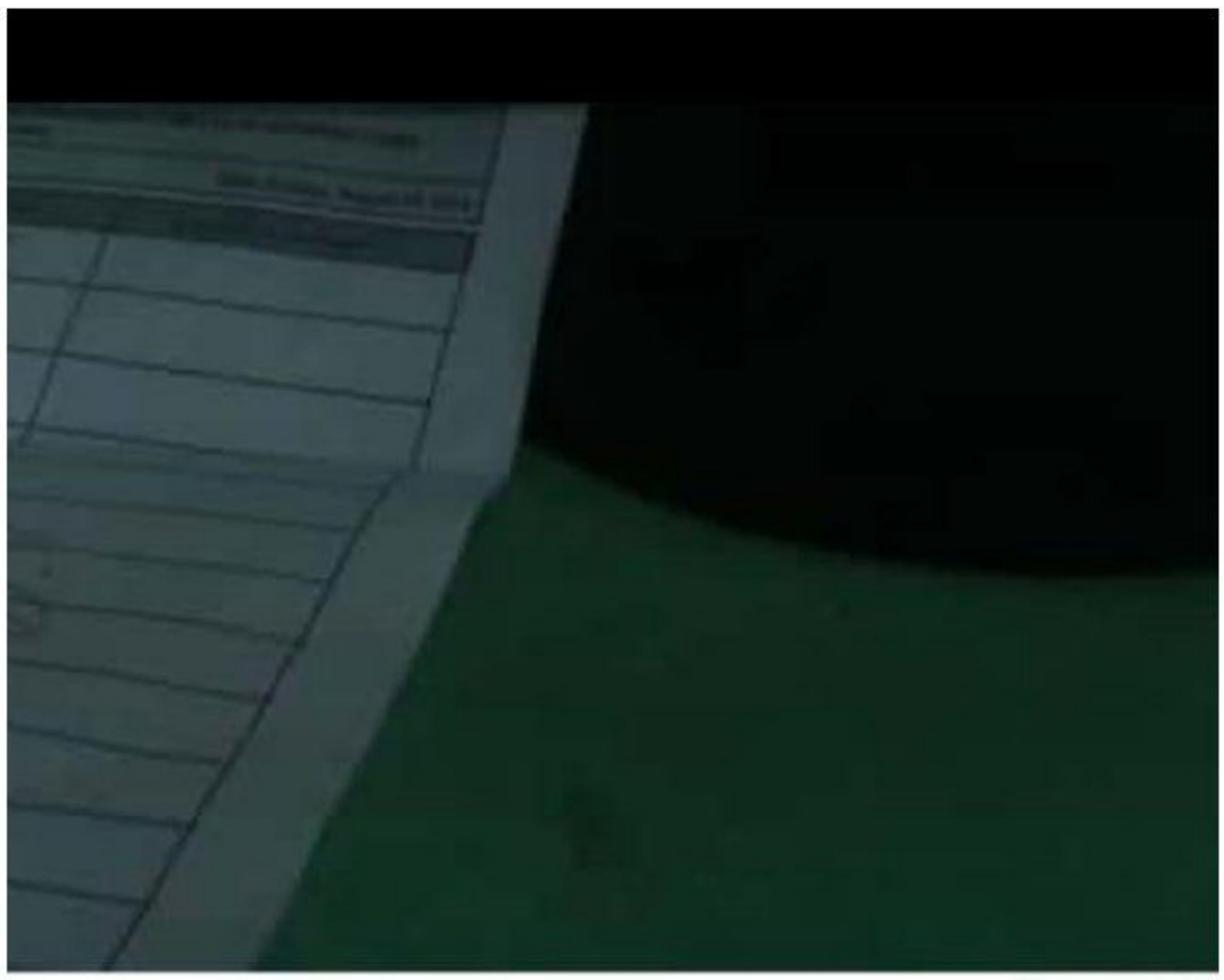
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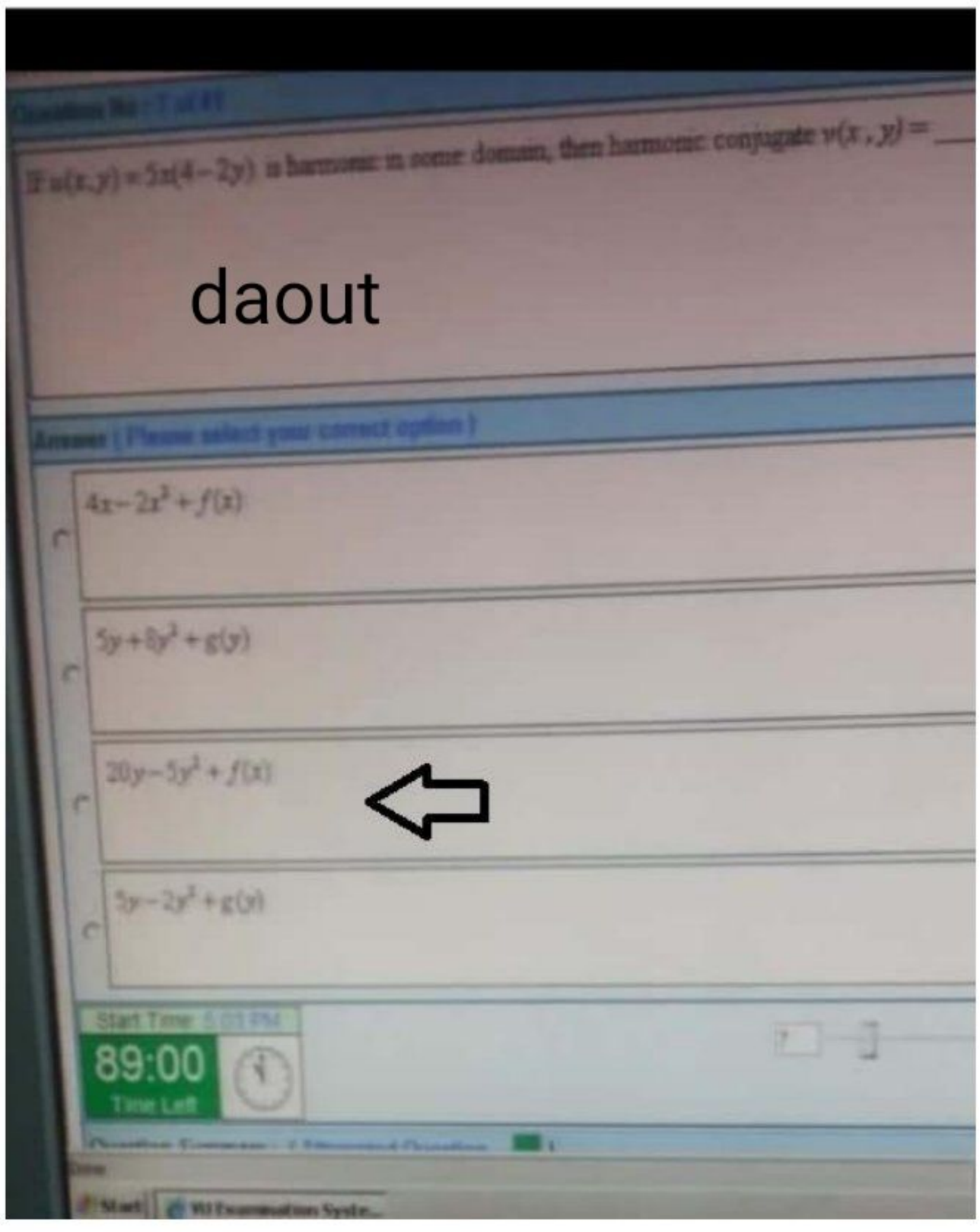
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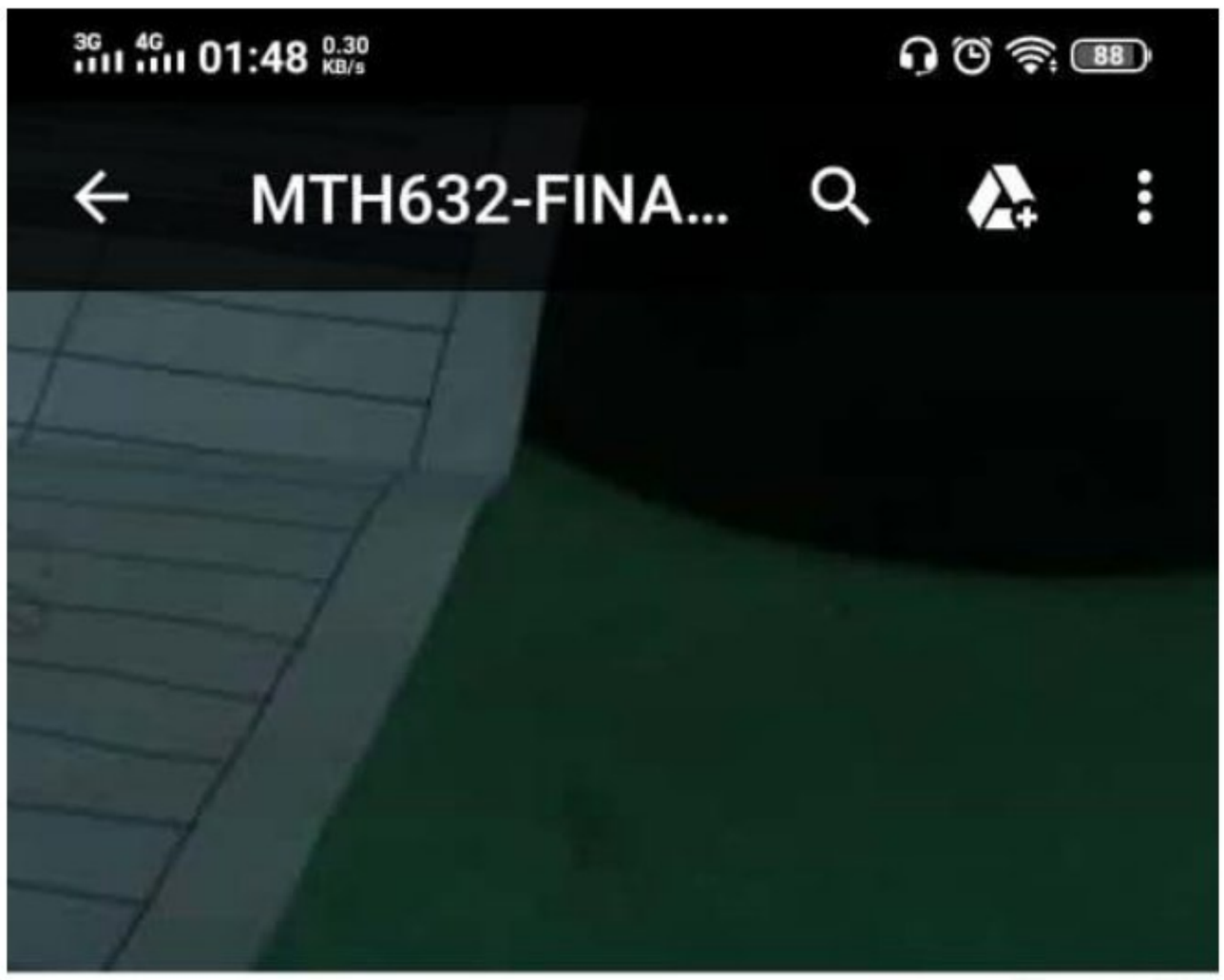
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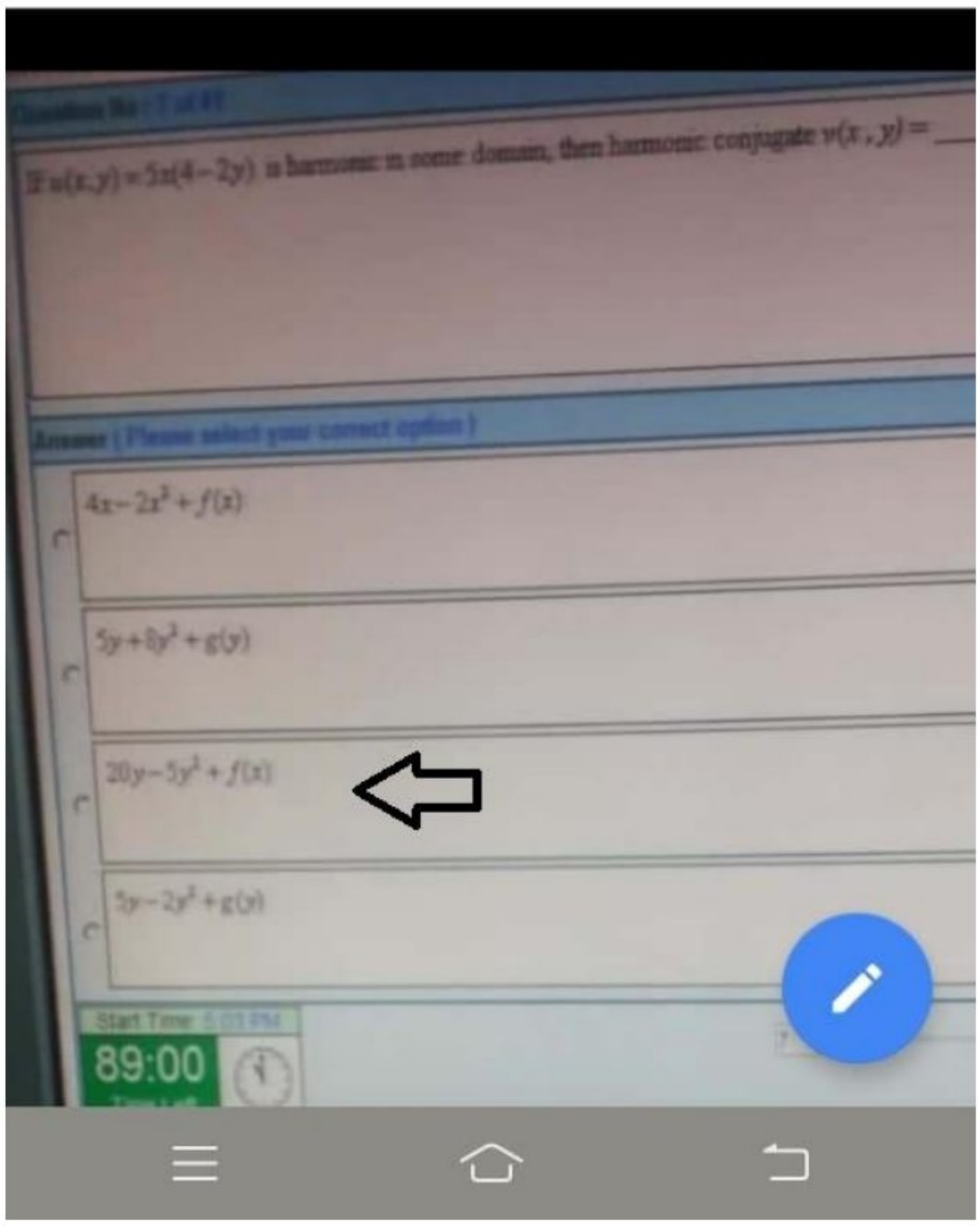
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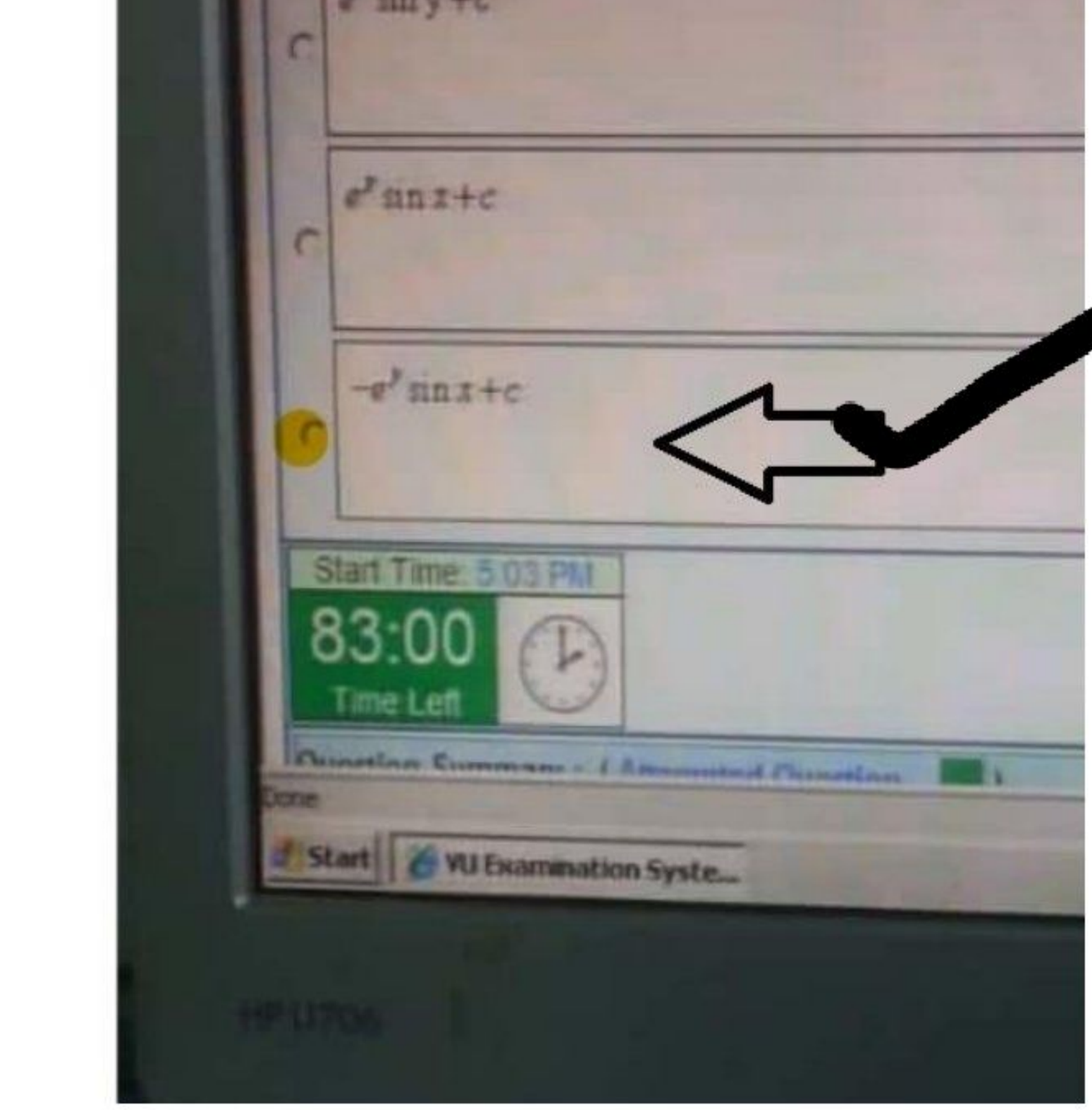
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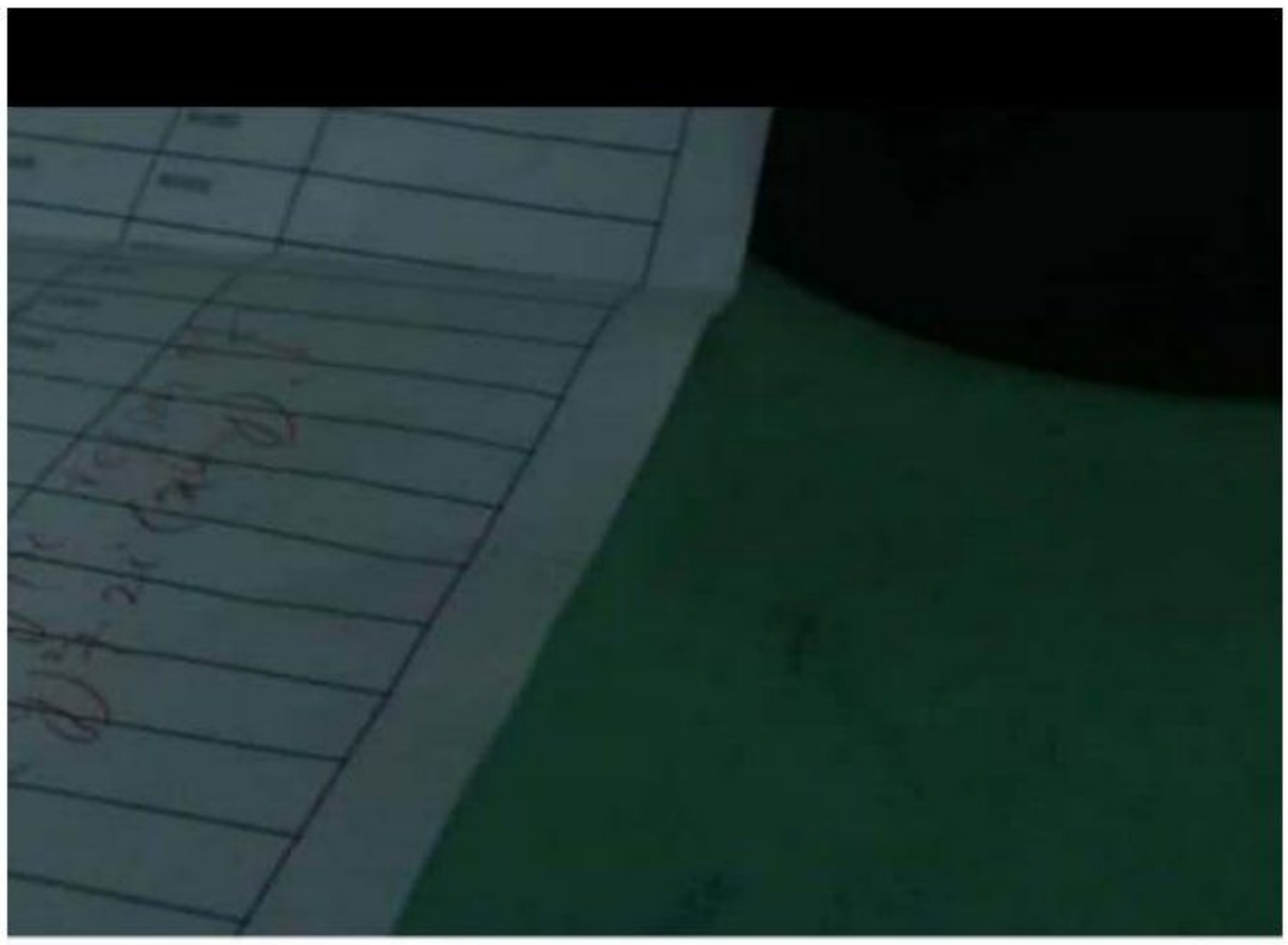
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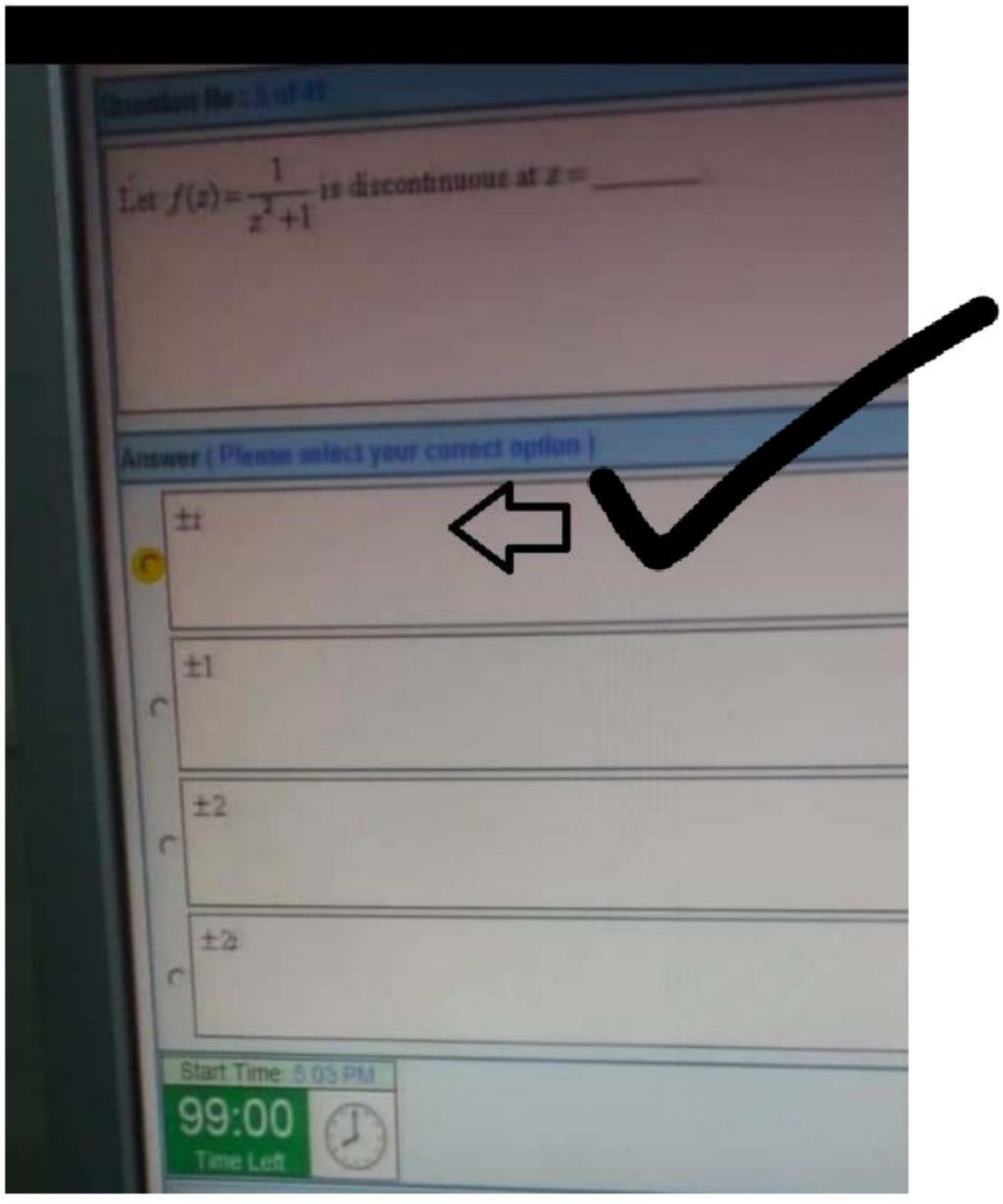
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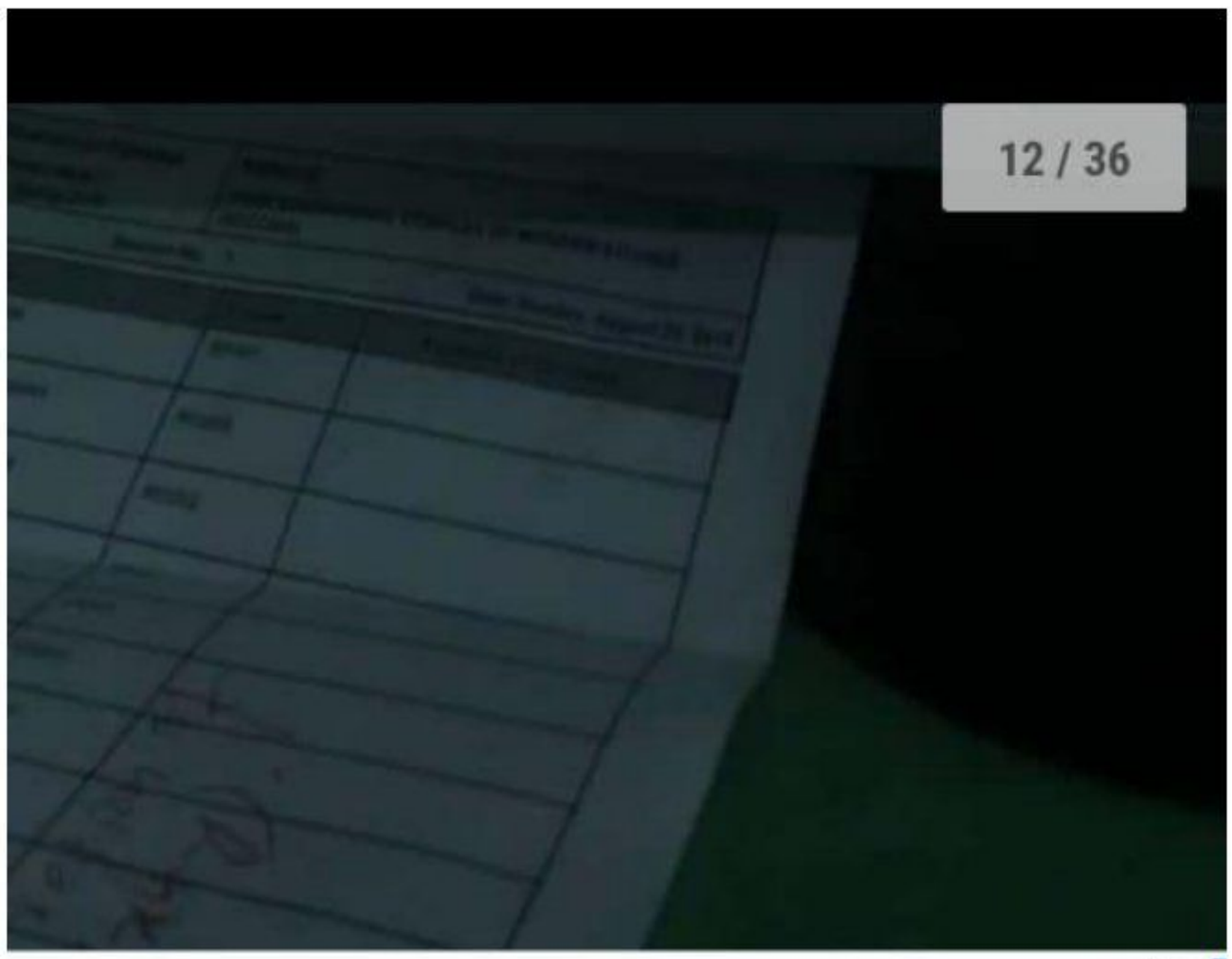
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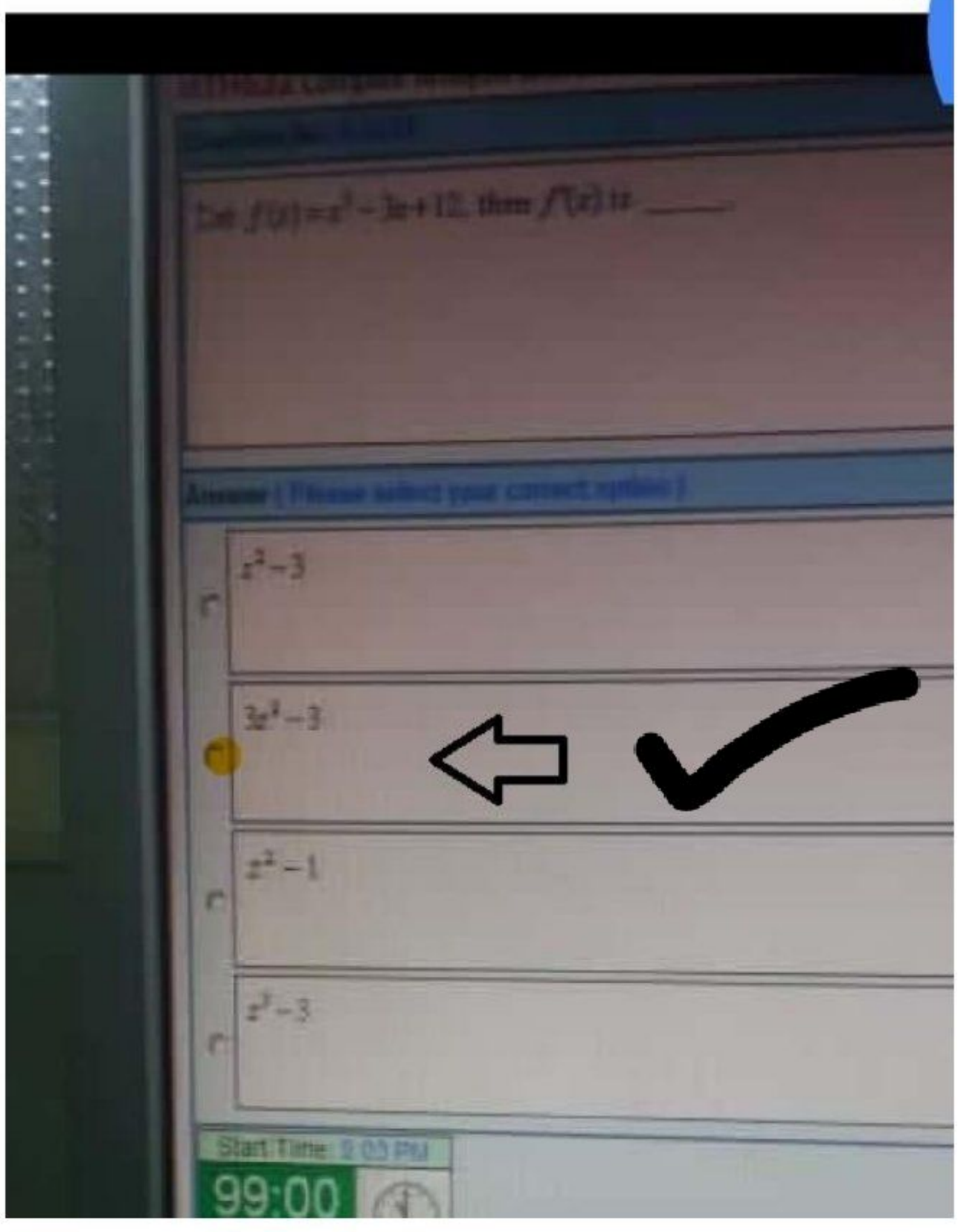
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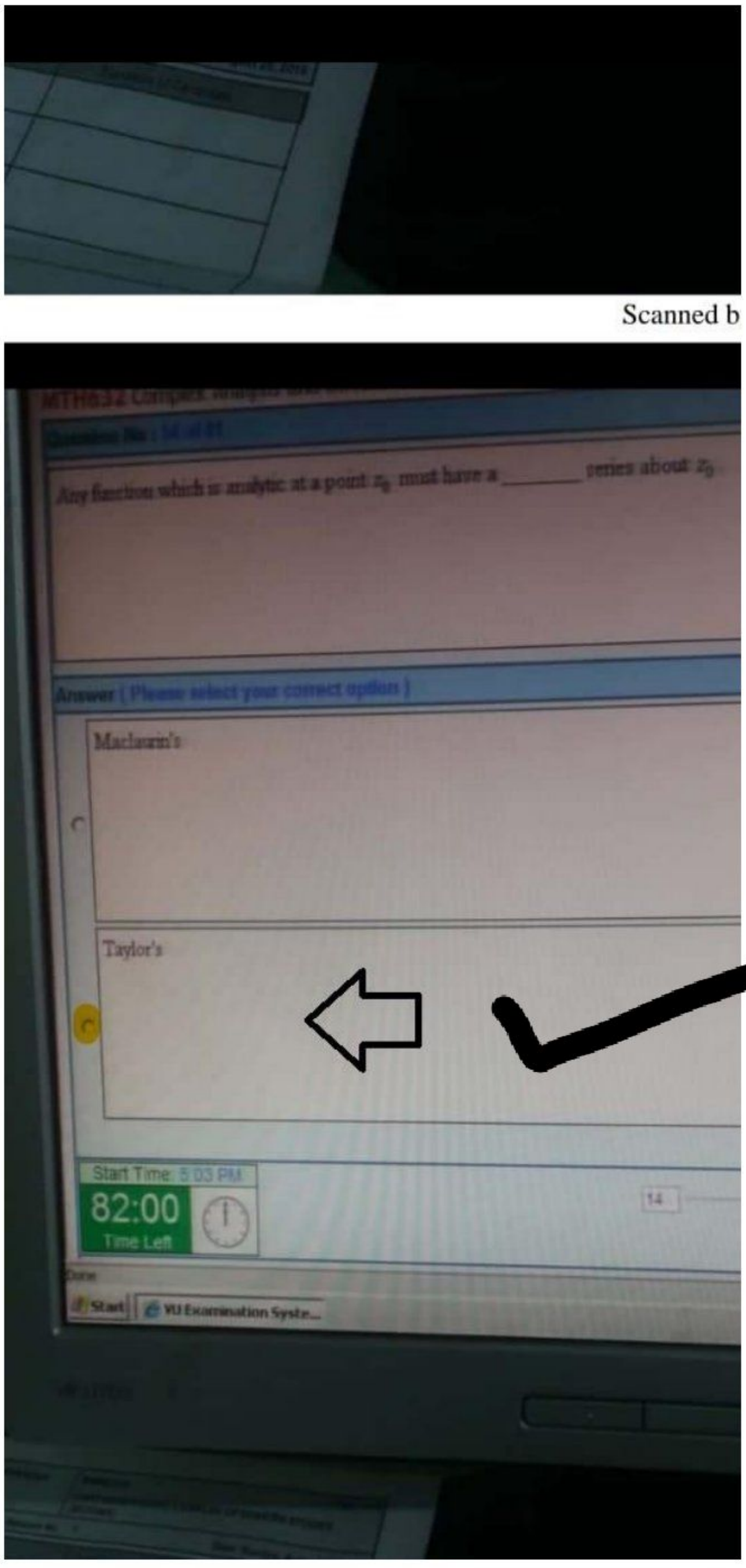
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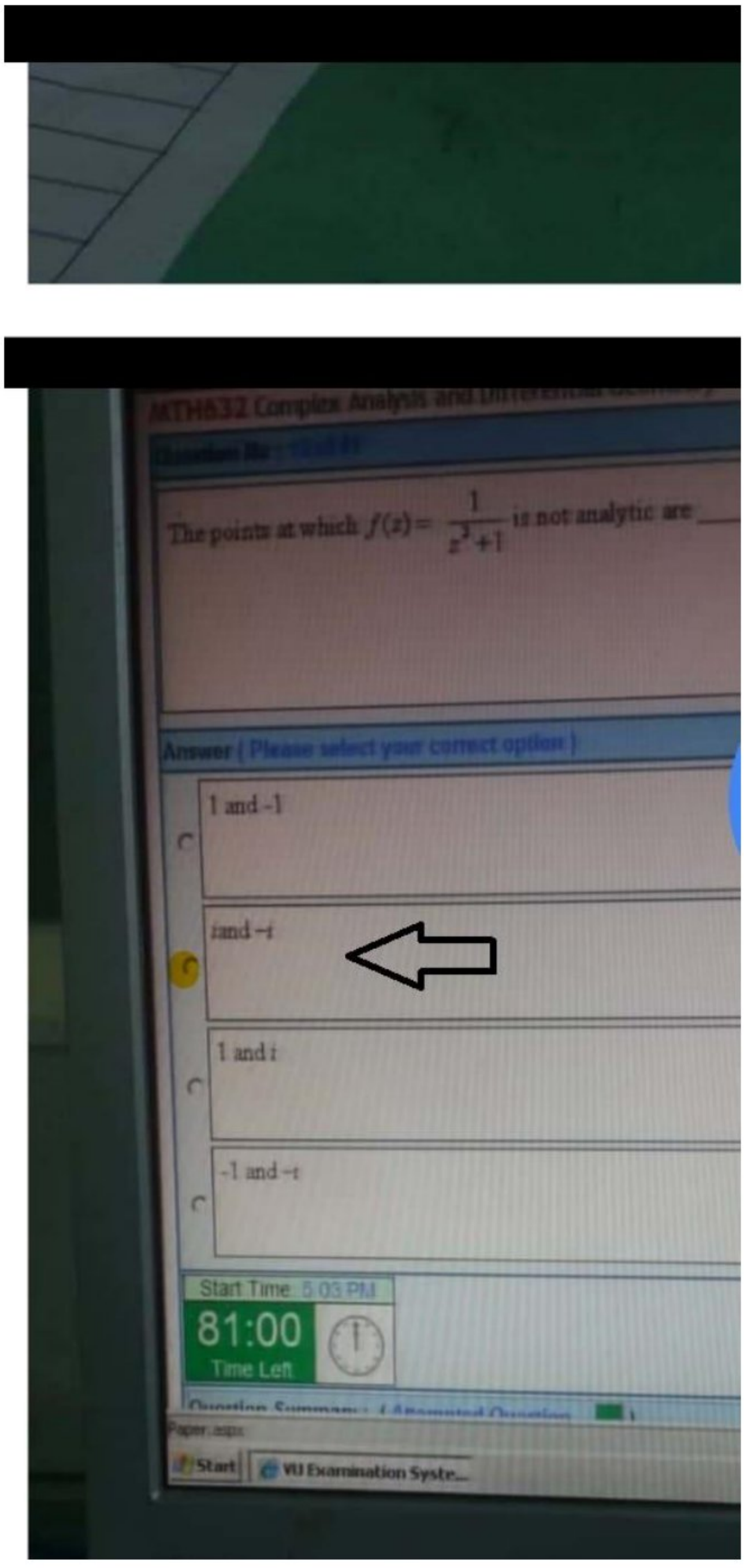


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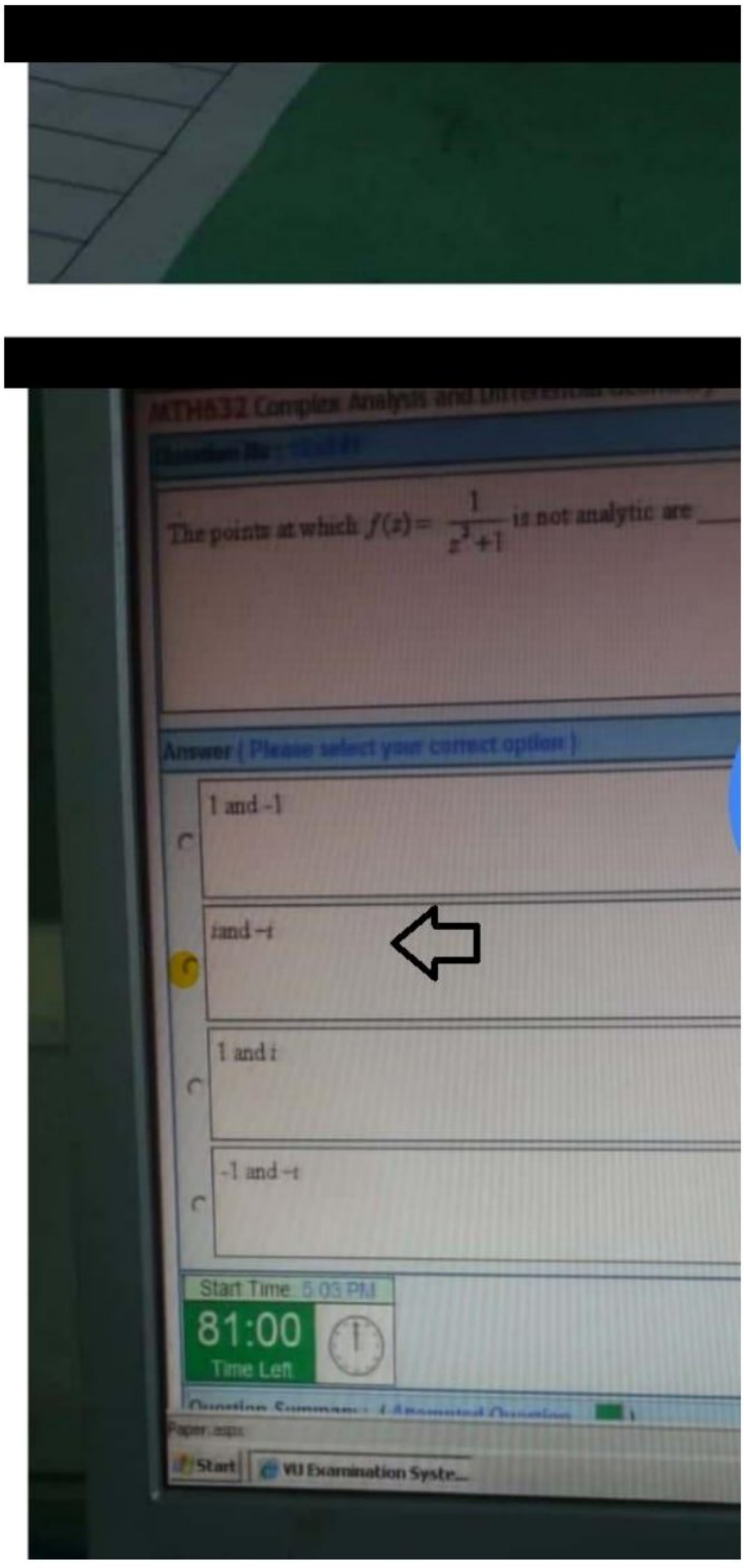


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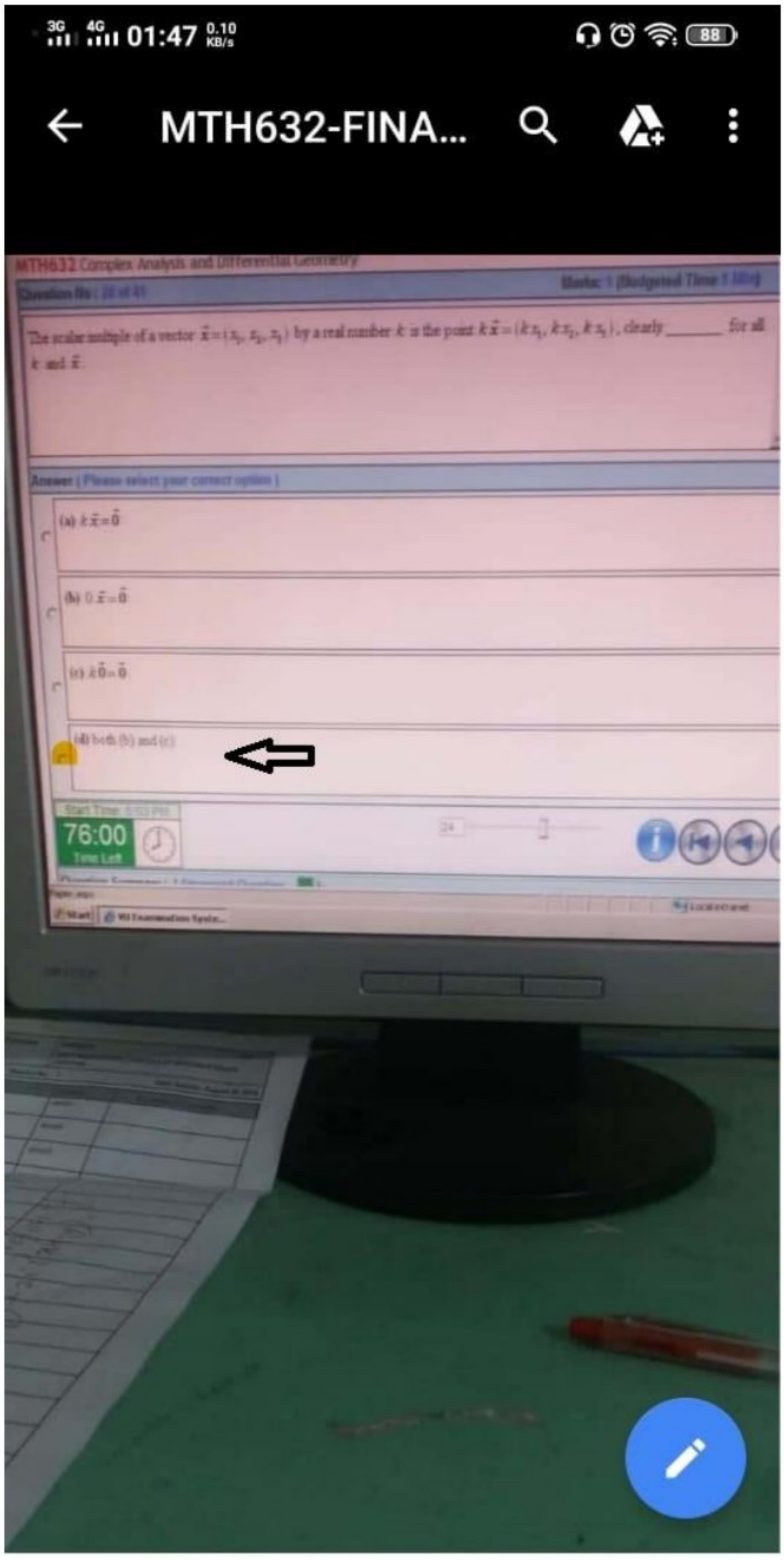
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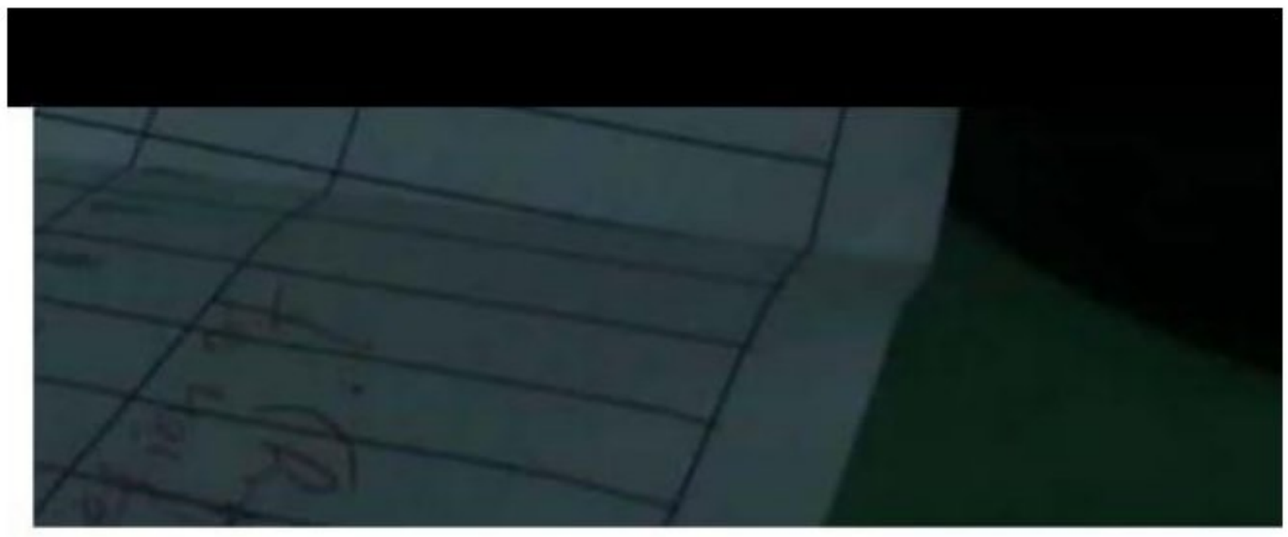
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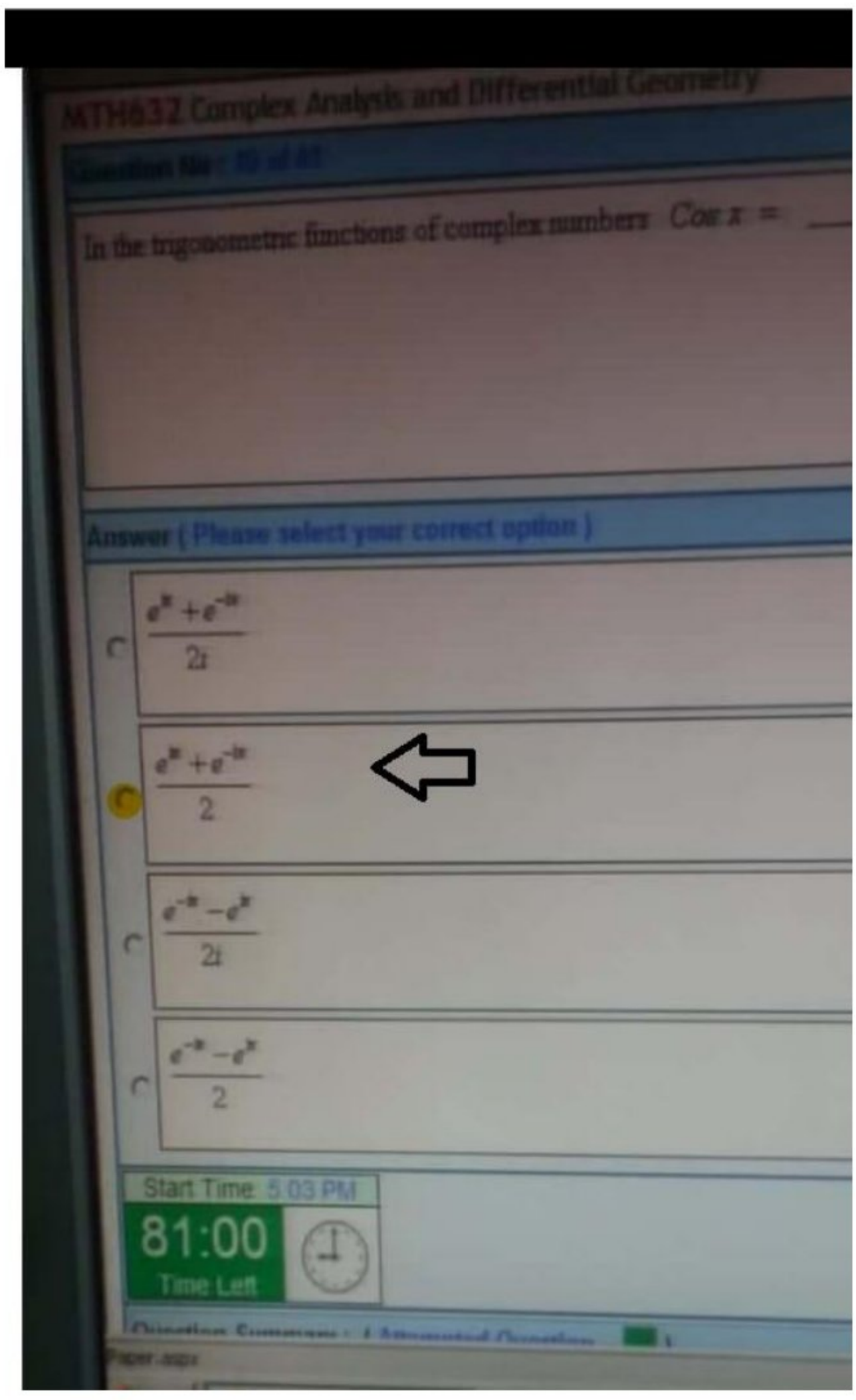


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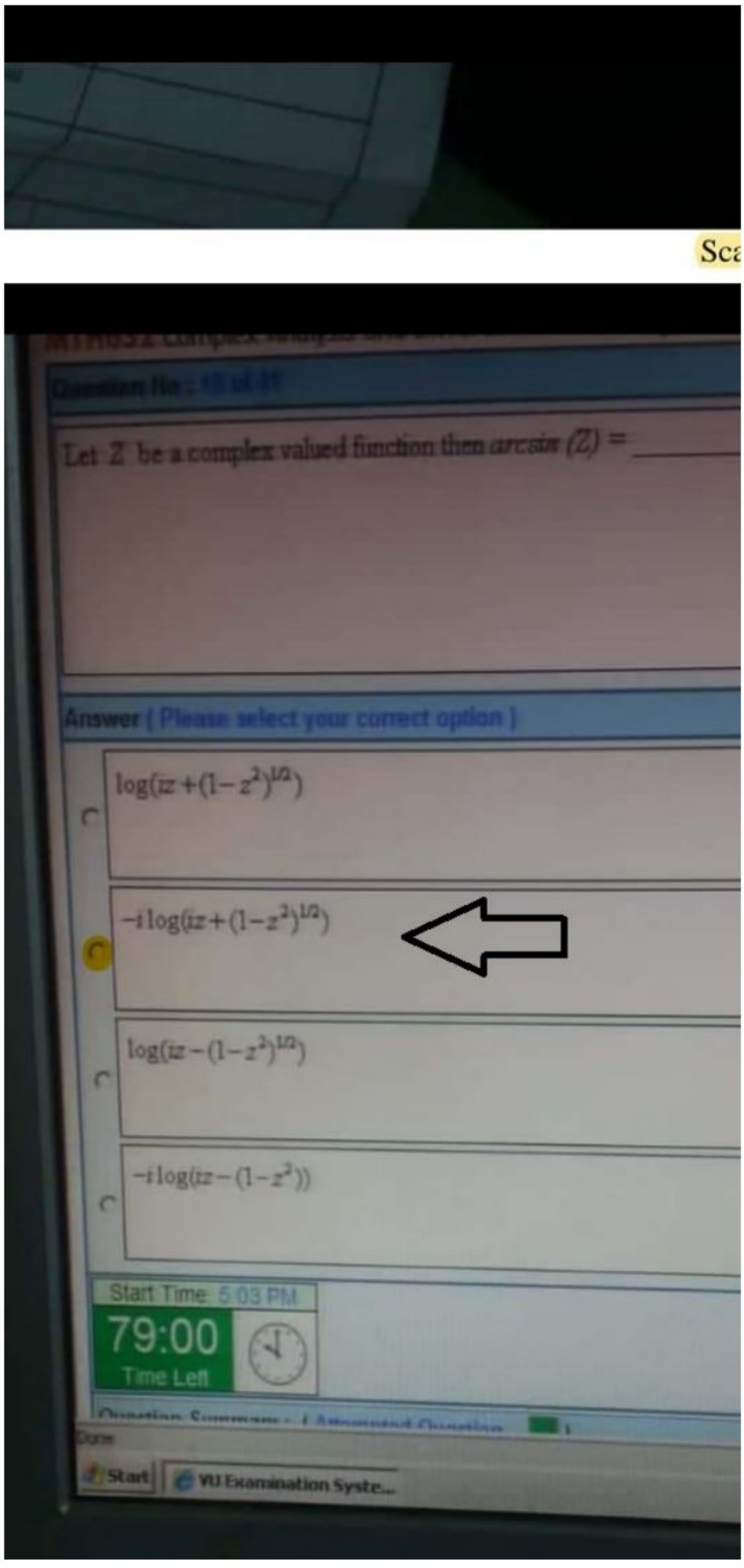


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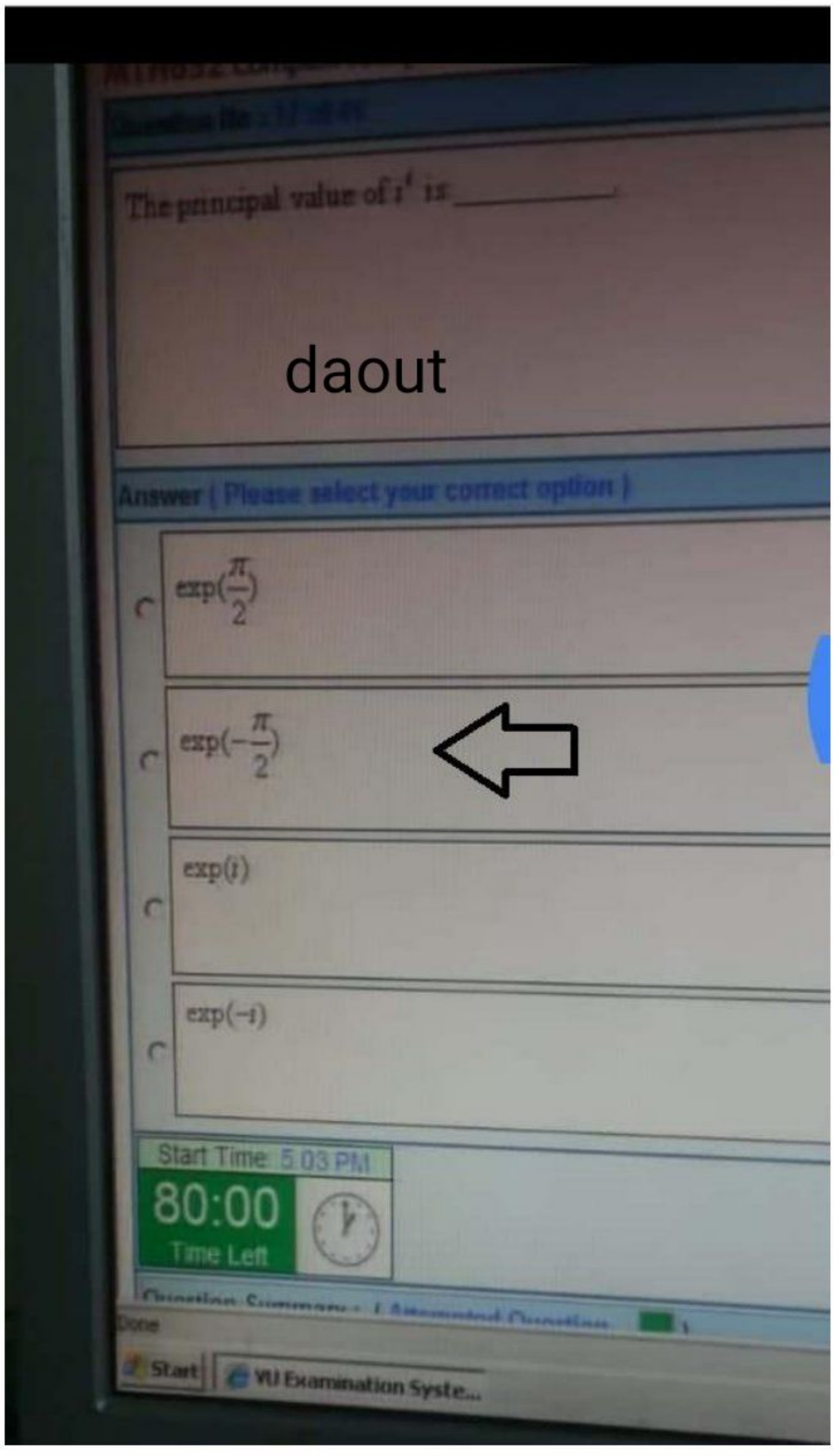
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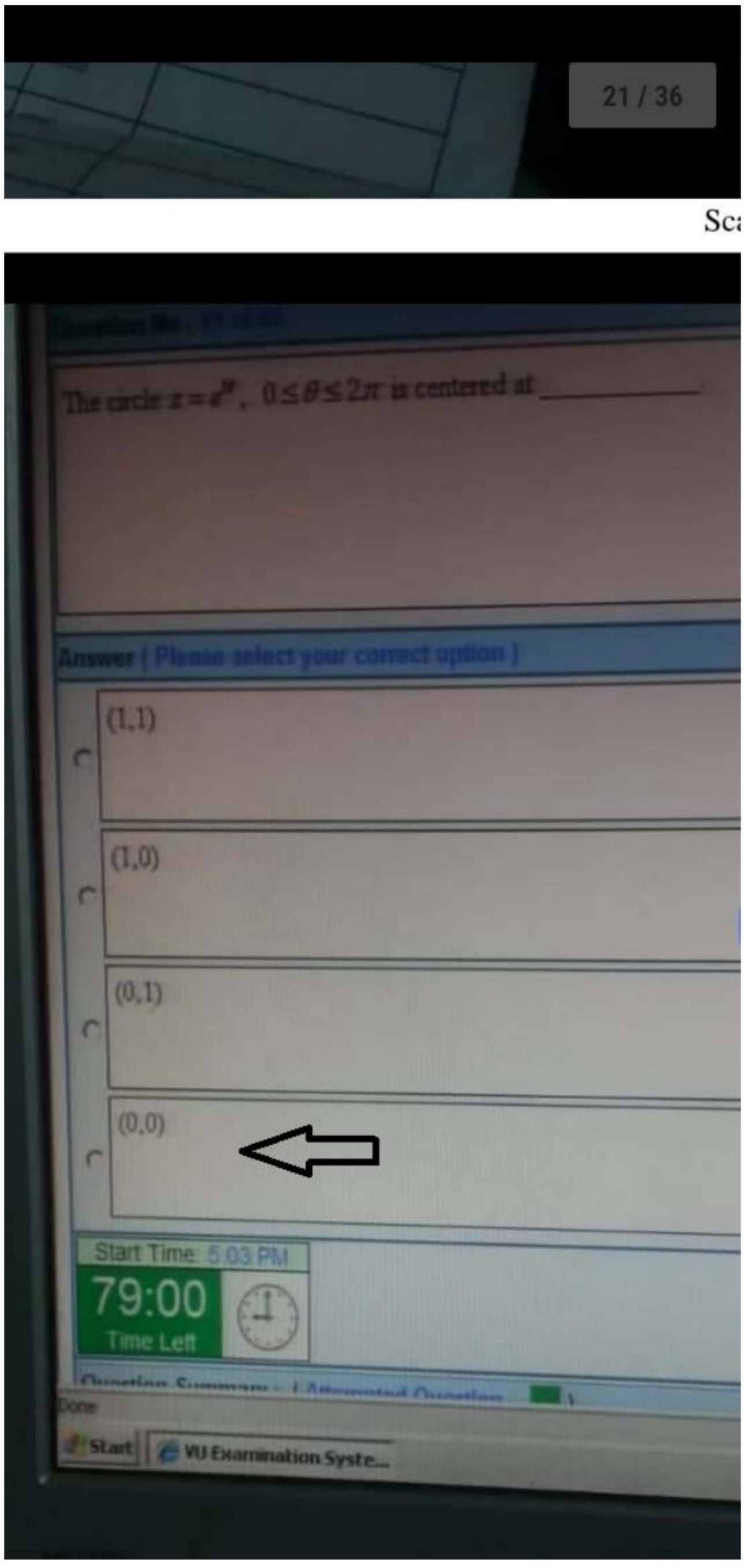
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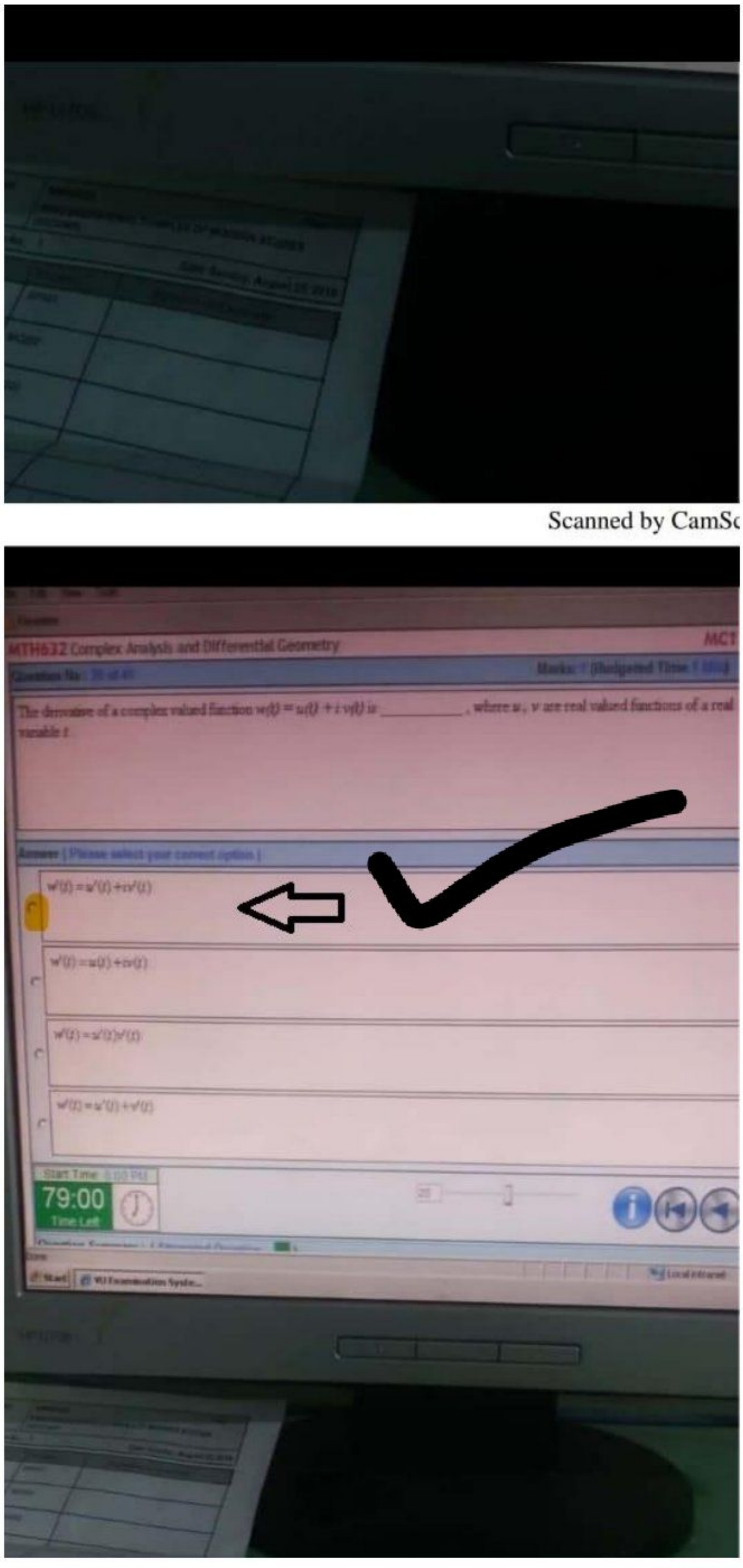
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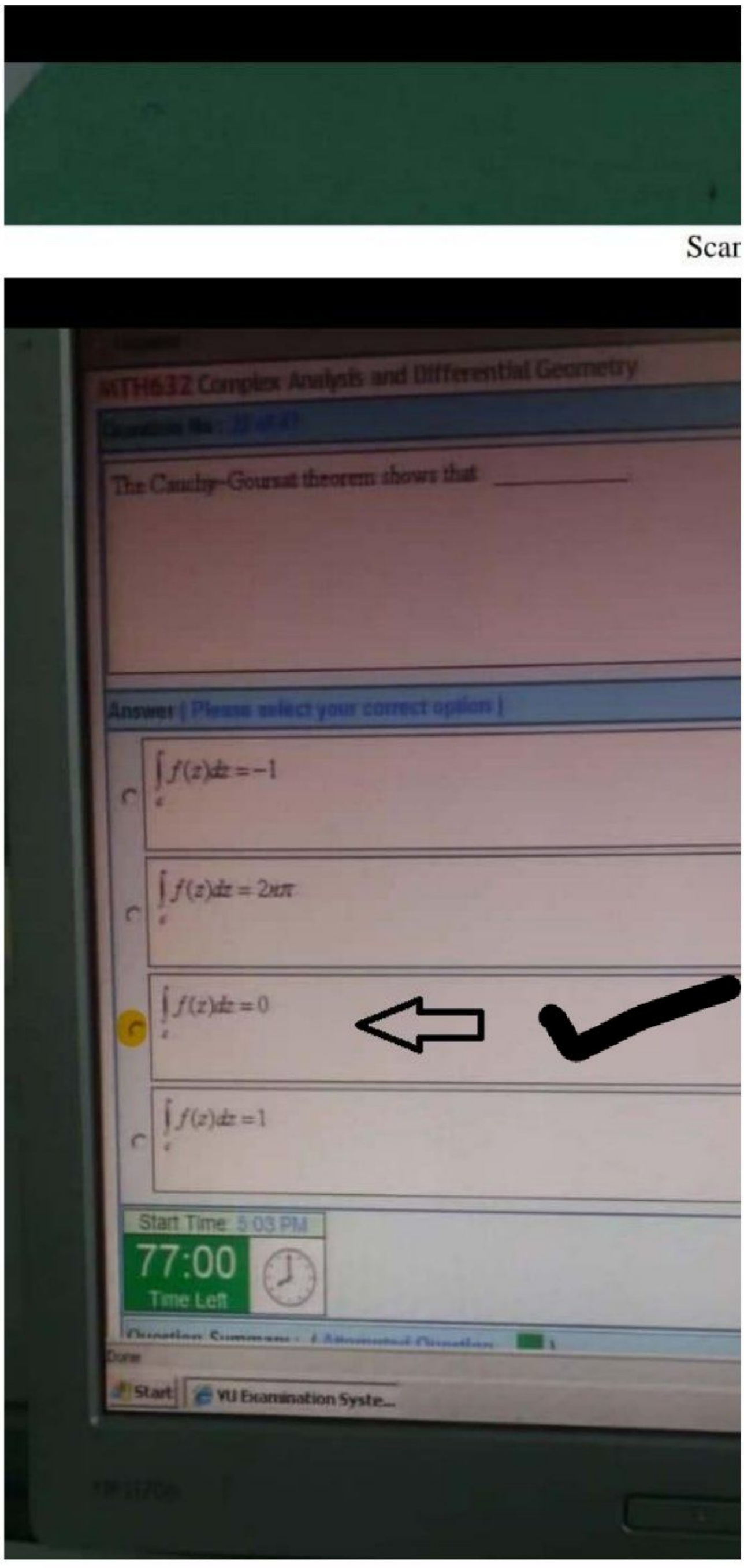


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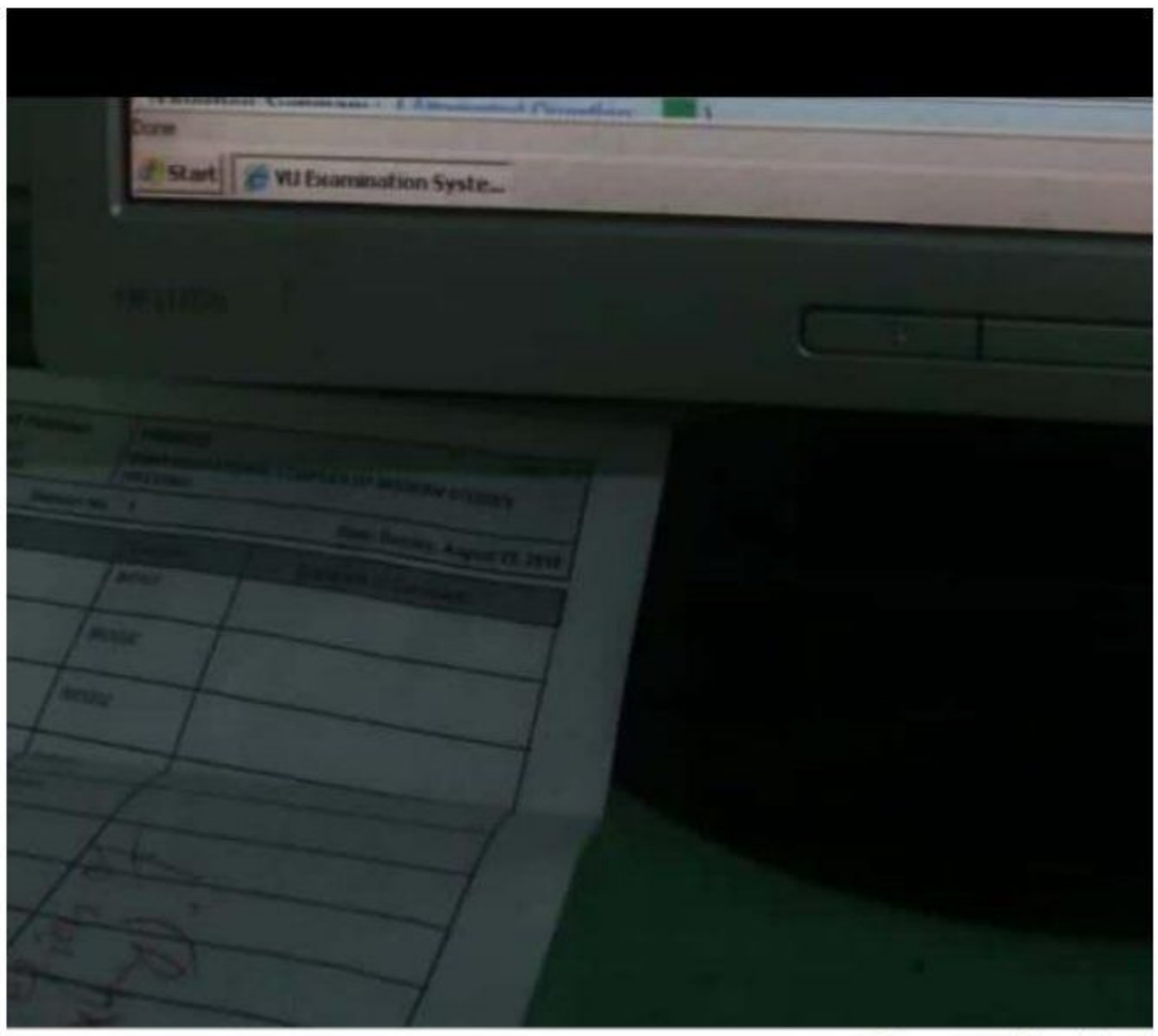
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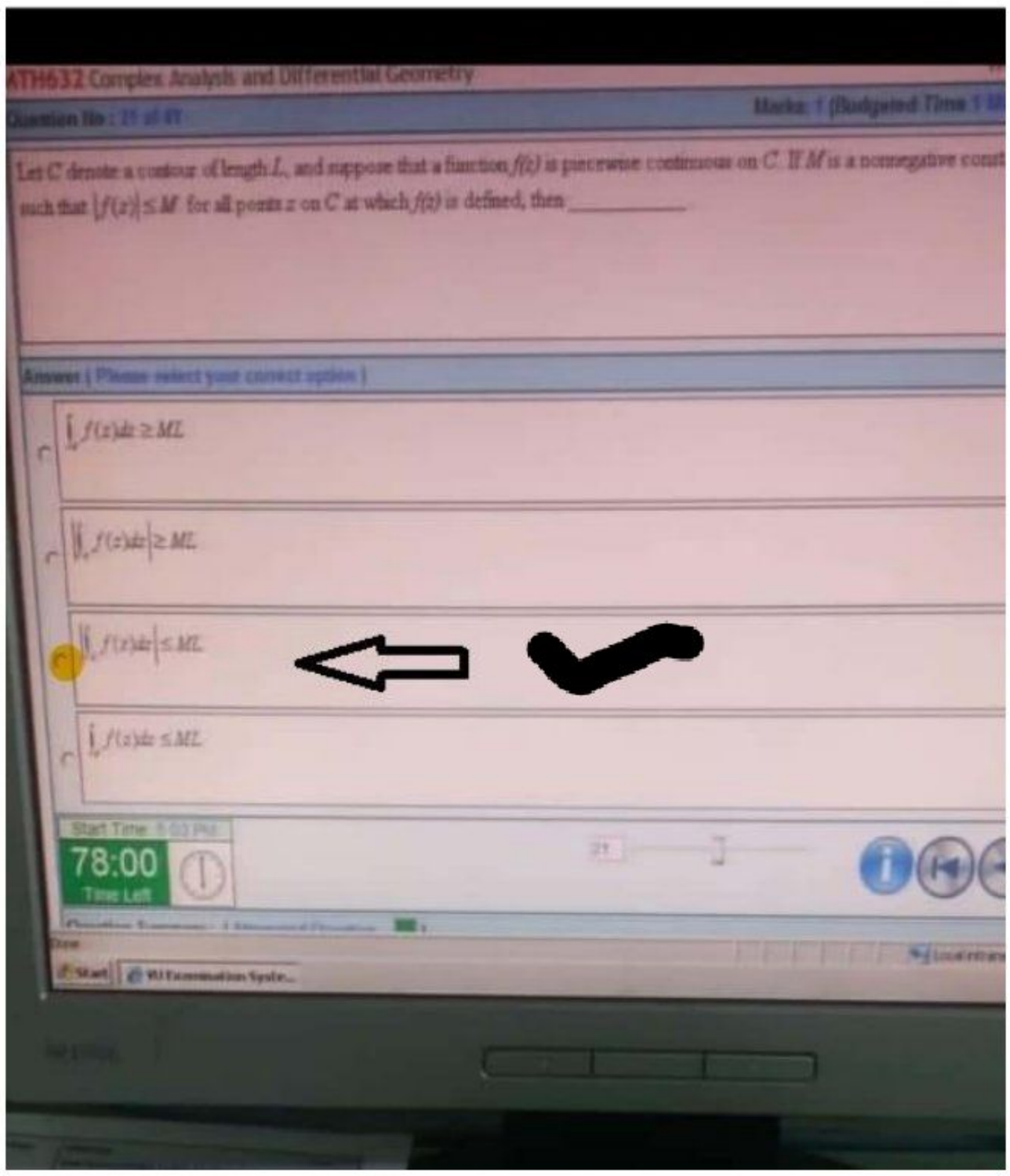


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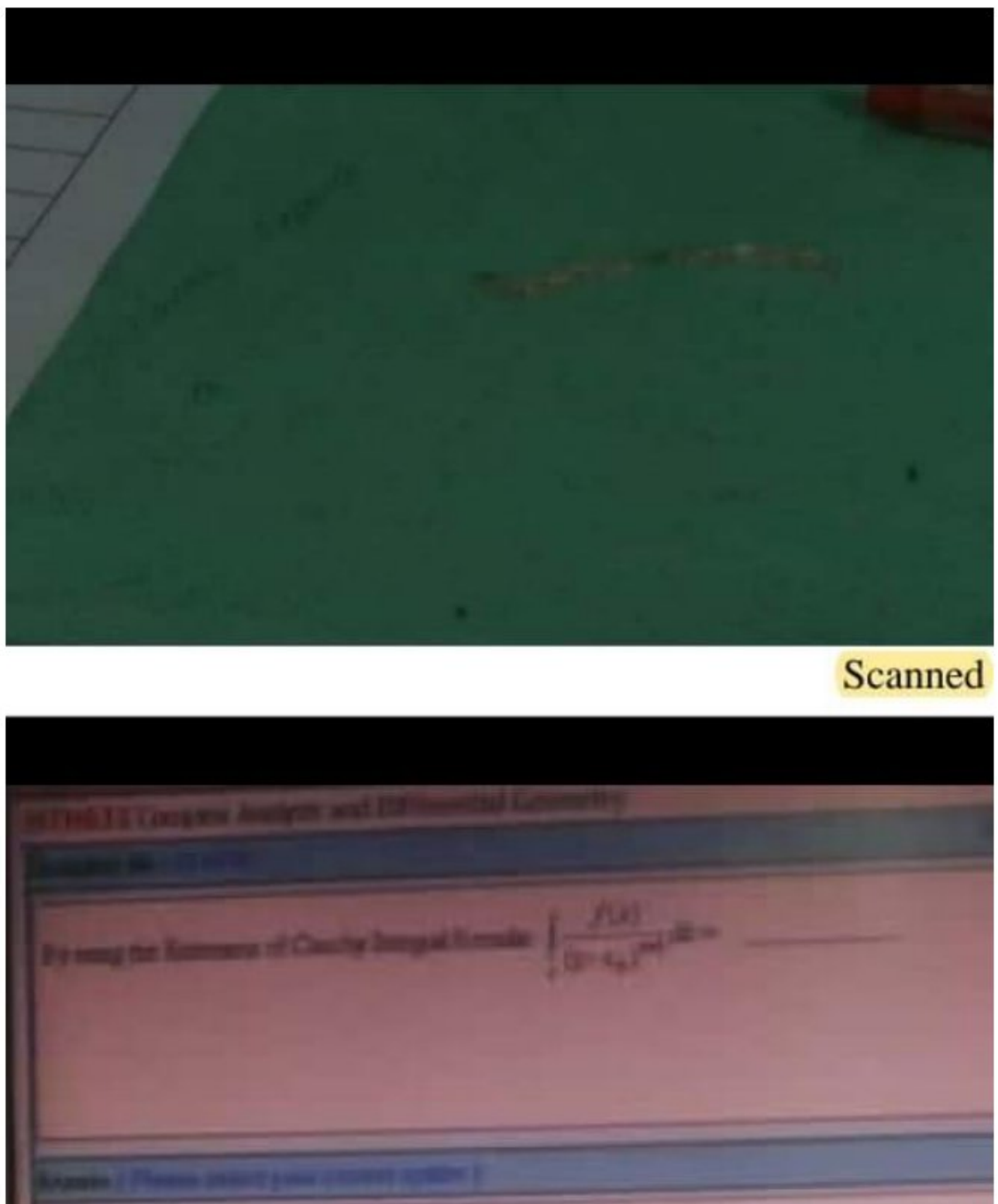
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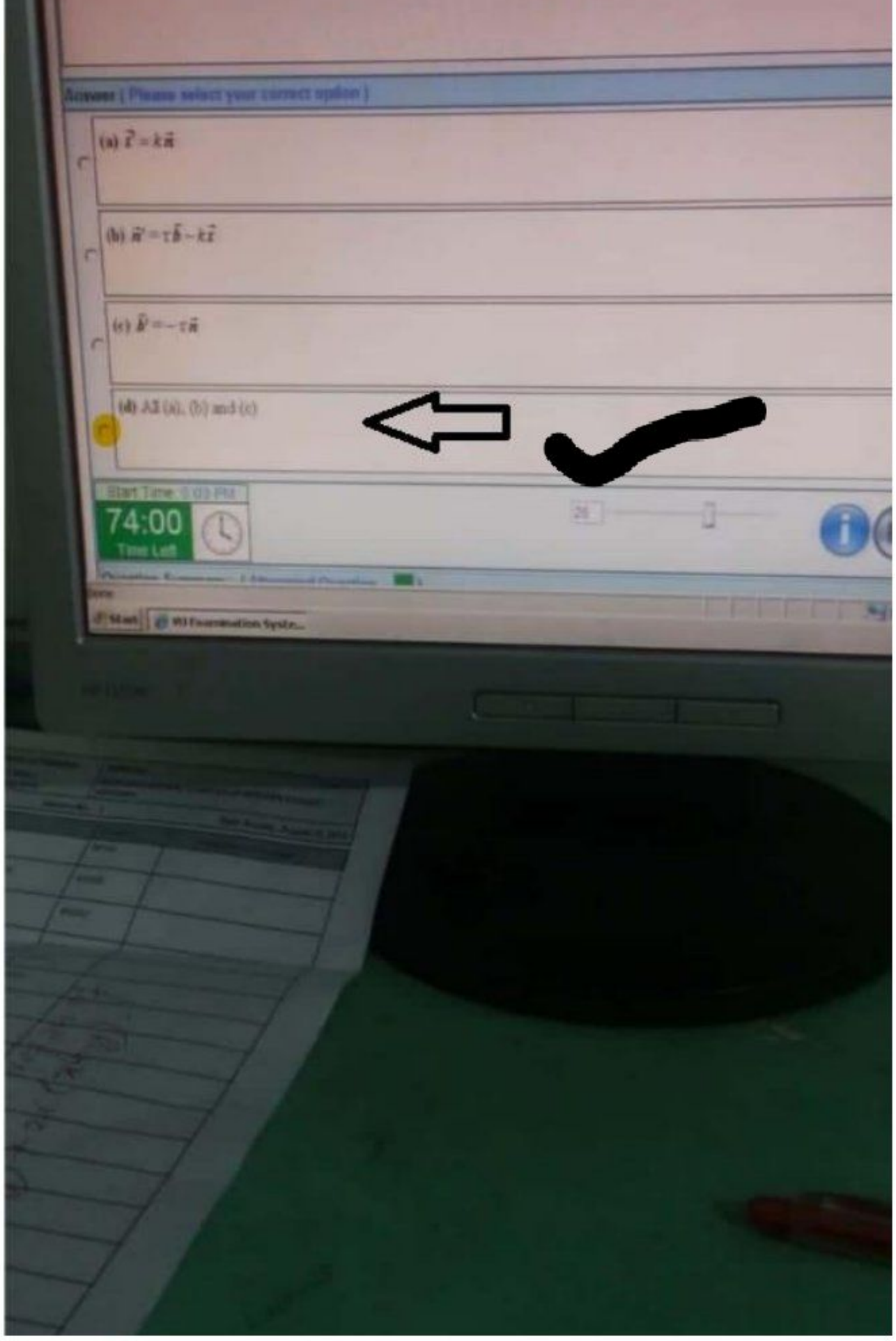


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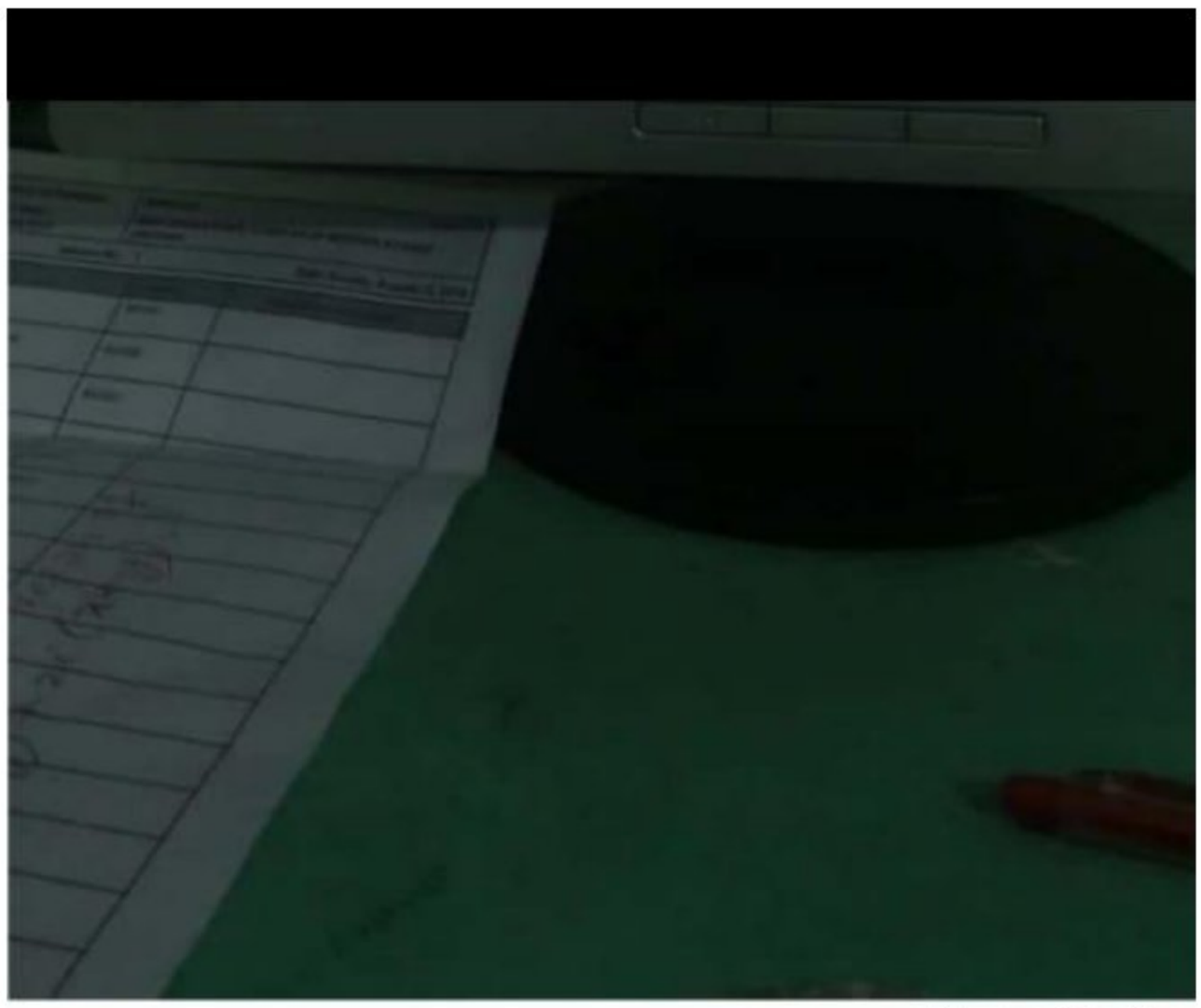


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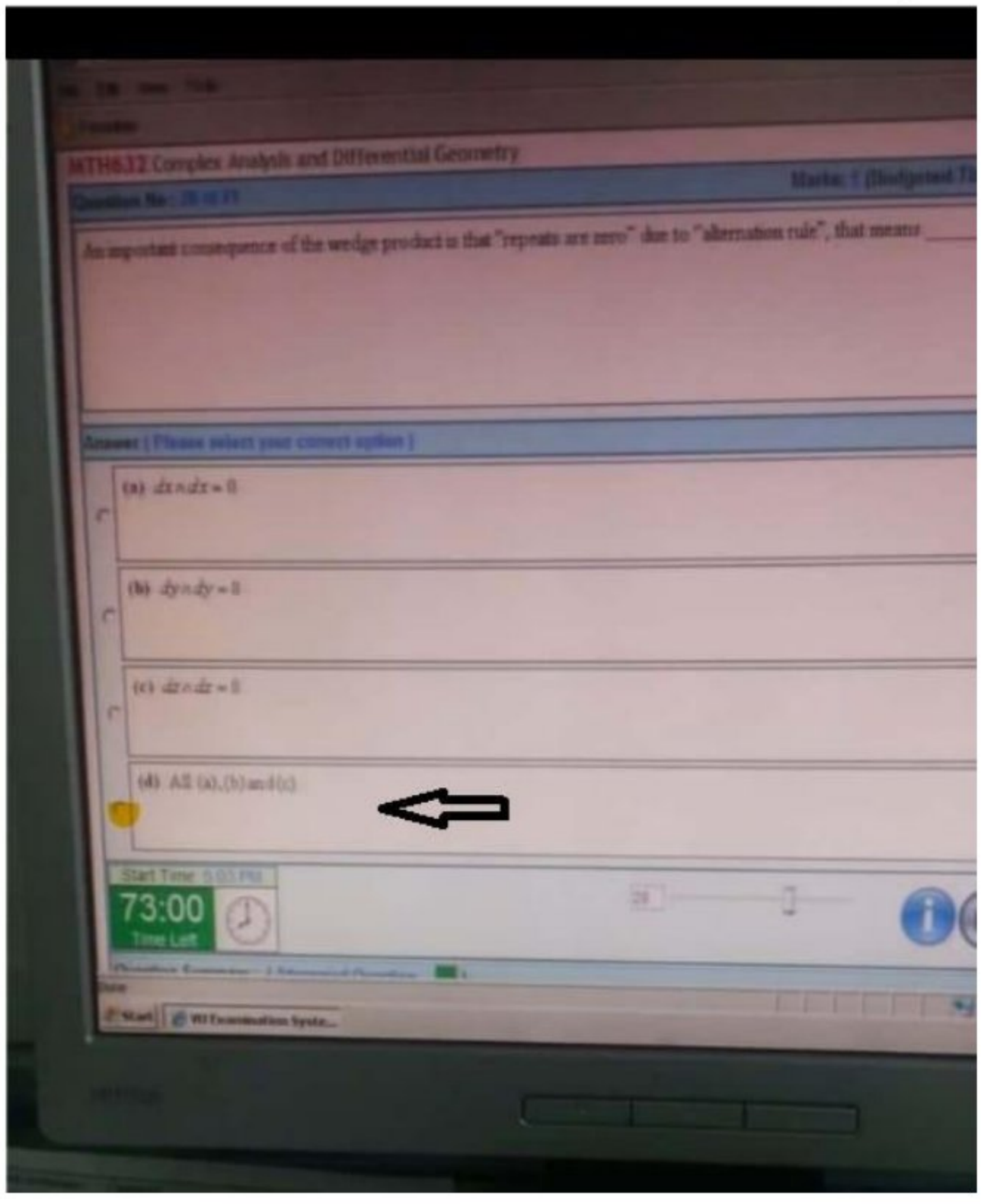
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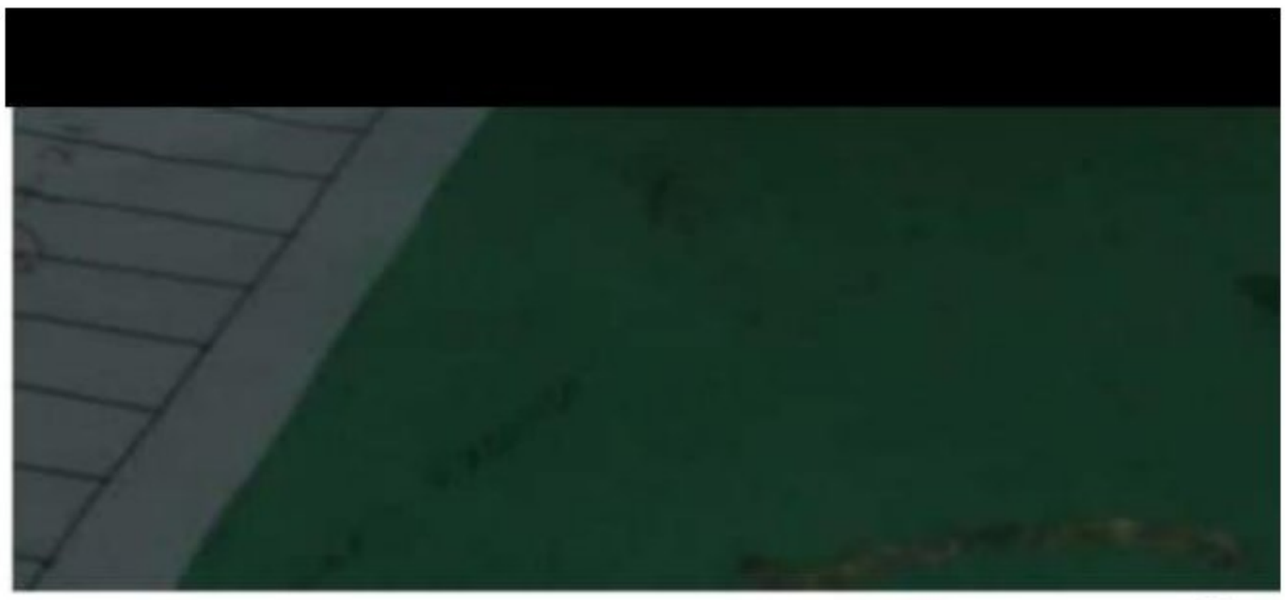
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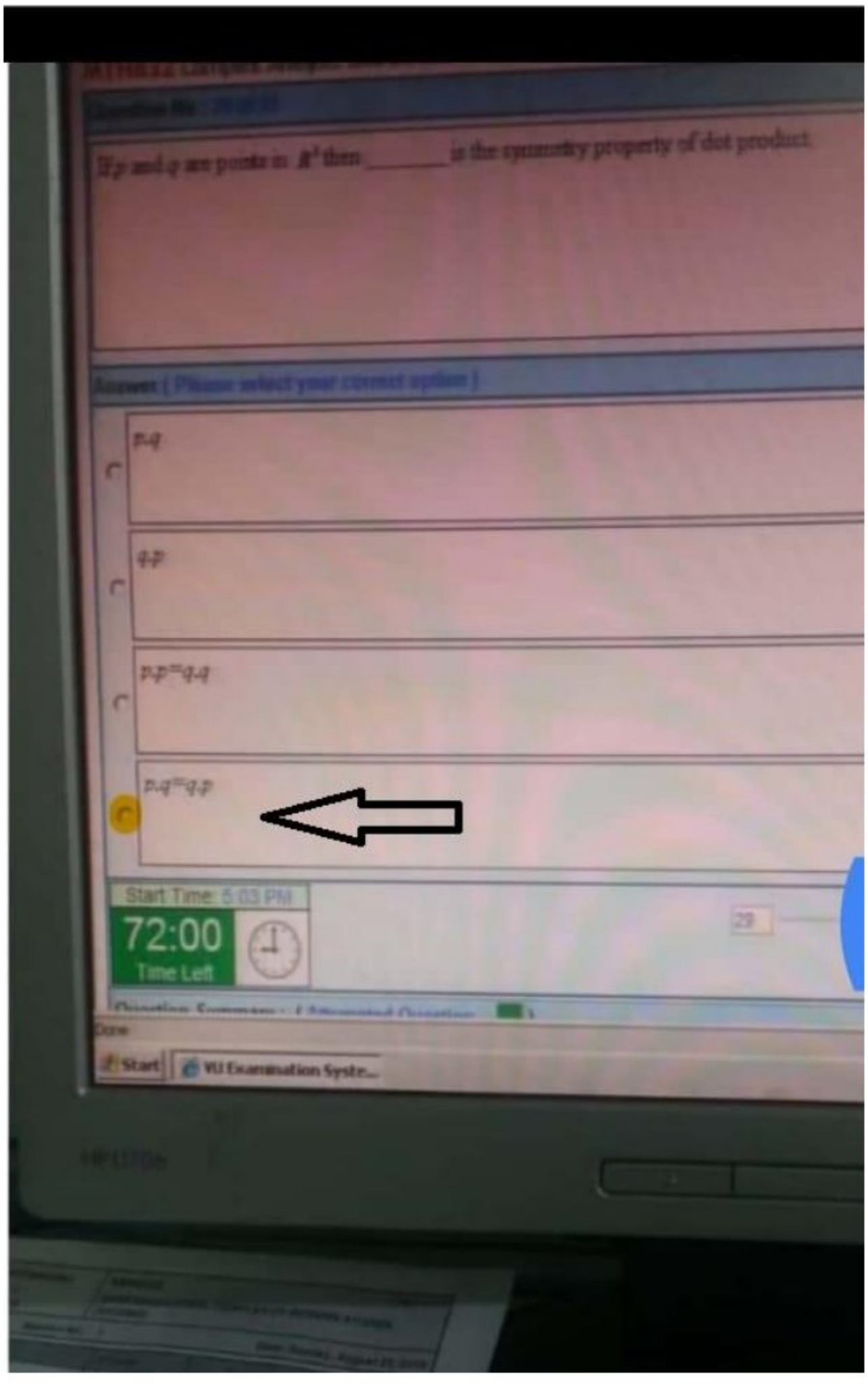
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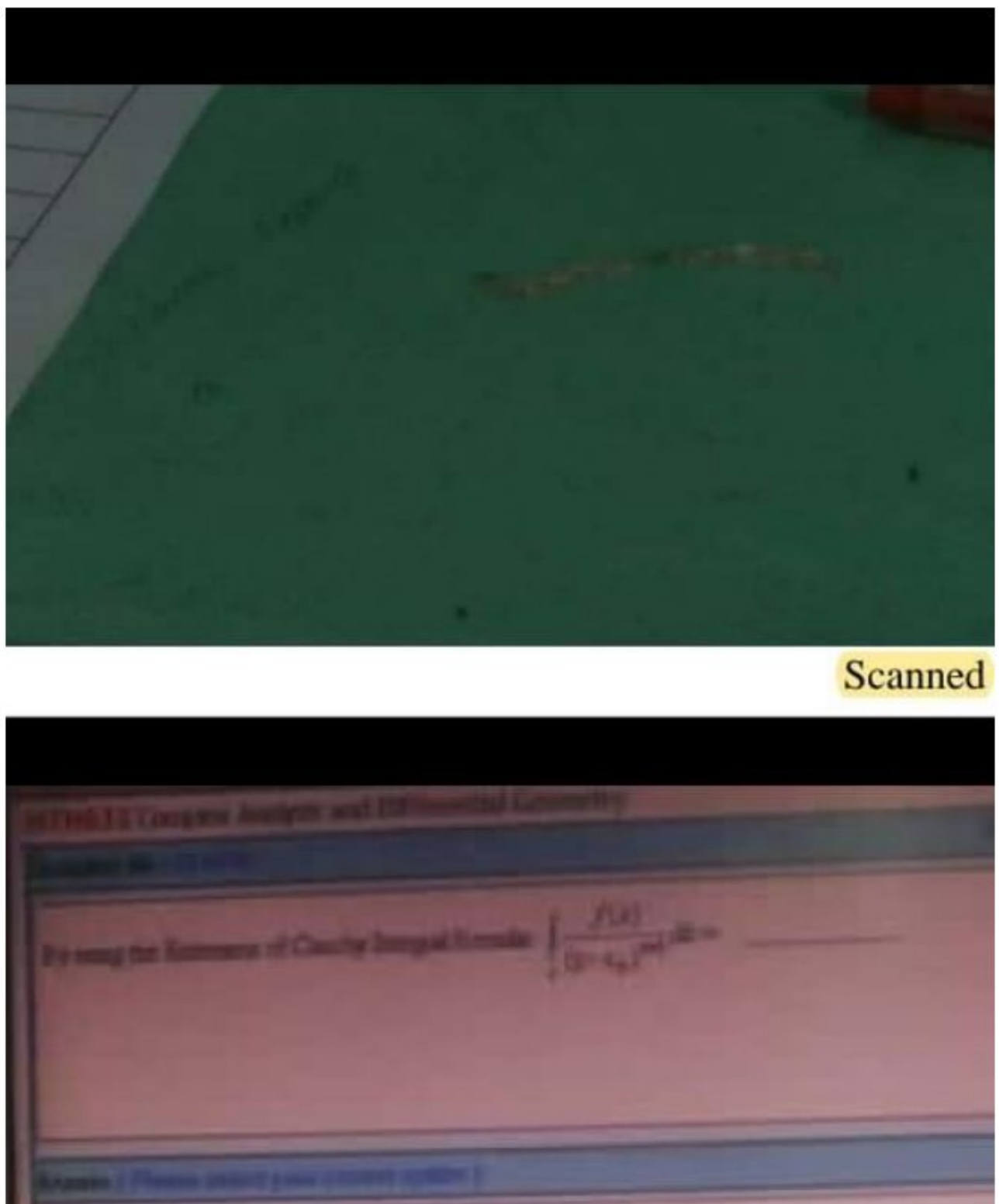
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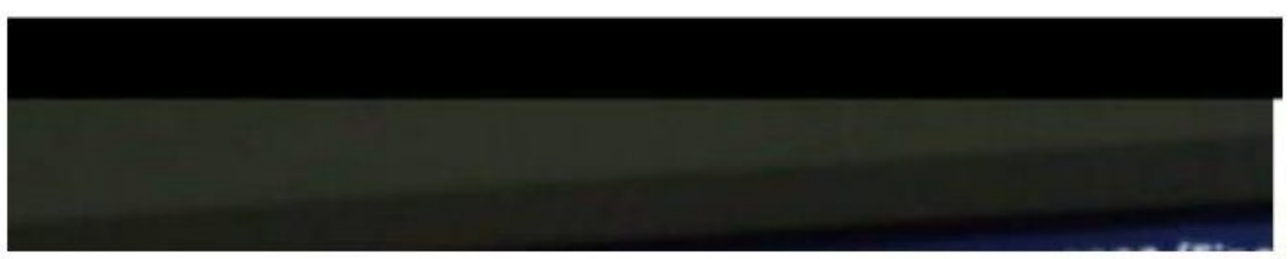
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Question No : 14 of 41

If $e^{ax}\cos y$ is harmonic then 'a' is _____.

Answer (Please select your correct option)

- 0
- -1
- 2
- 1



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MTH032 Complex Analysis and Differential Geometry

Question No : 11 of 41

If $f(z) = x + ay + i(bx + cy)$ is analytic, then a, b, c equals to _____

Answer (Please select your correct option)

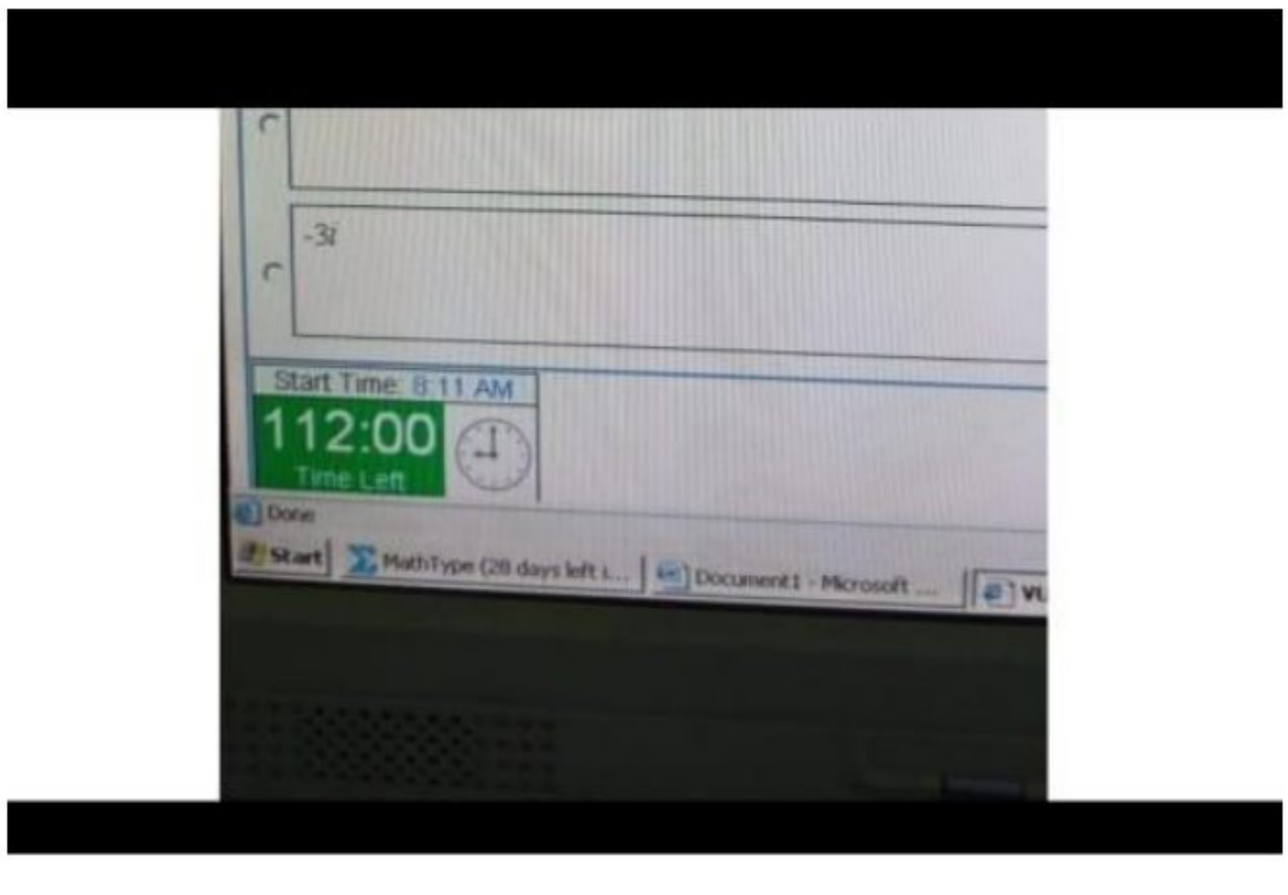
- $c=1$ and $a=-b$ ⇦
- $a=1$ and $c=-b$
- $b=1$ and $a=-c$
- $a=b=c=1$

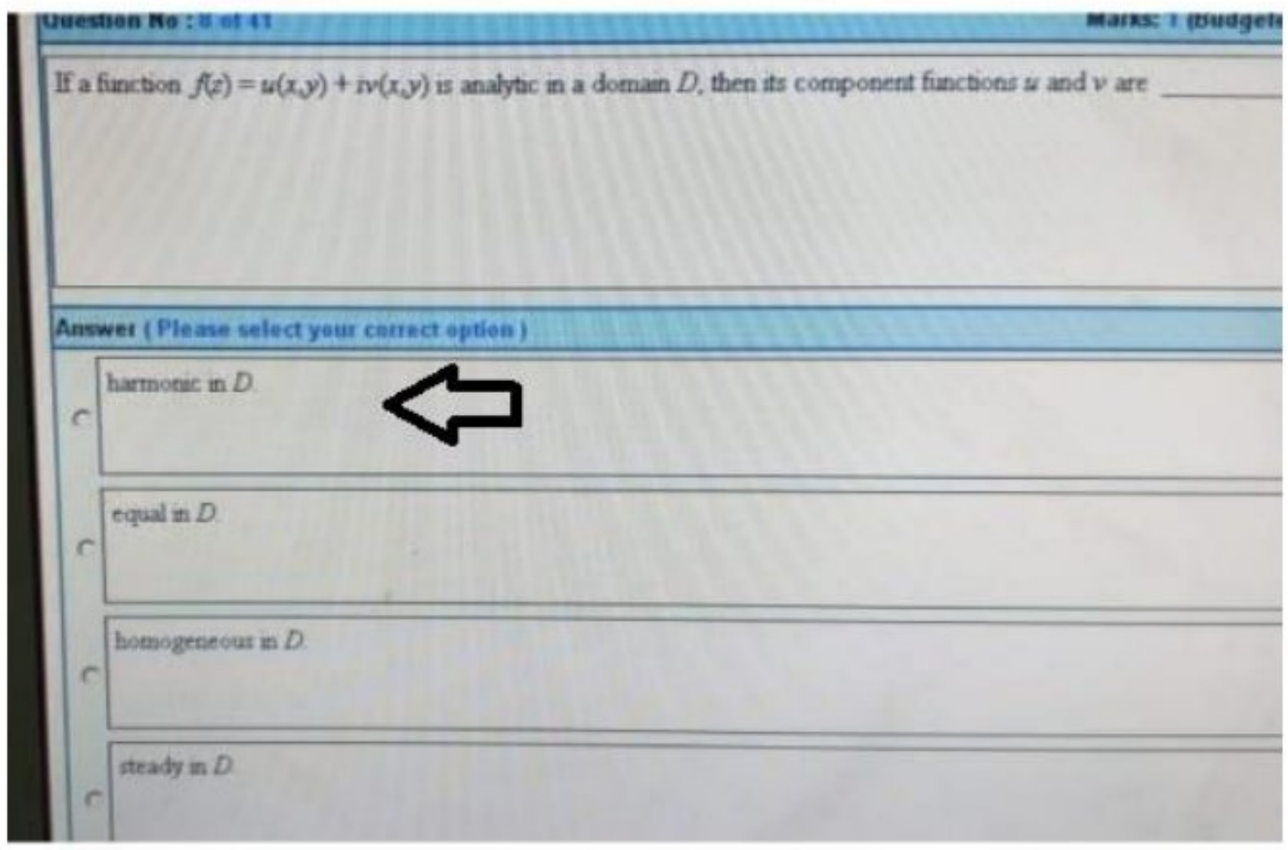
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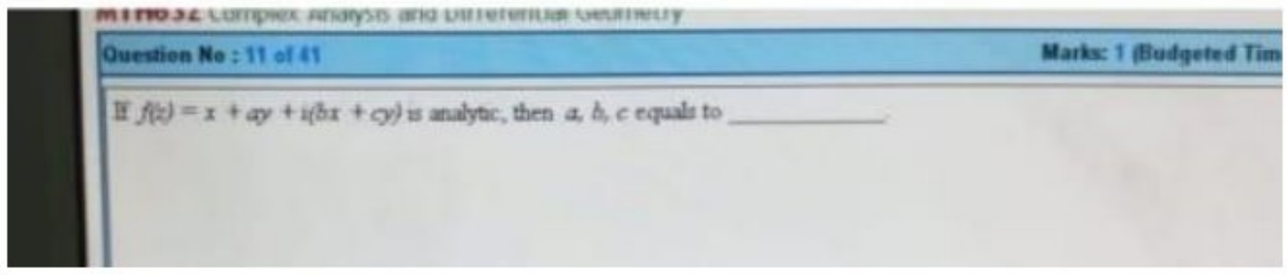
Question No : 14 of 41

If $e^{ax}\cos y$ is harmonic then 'a' is _____.

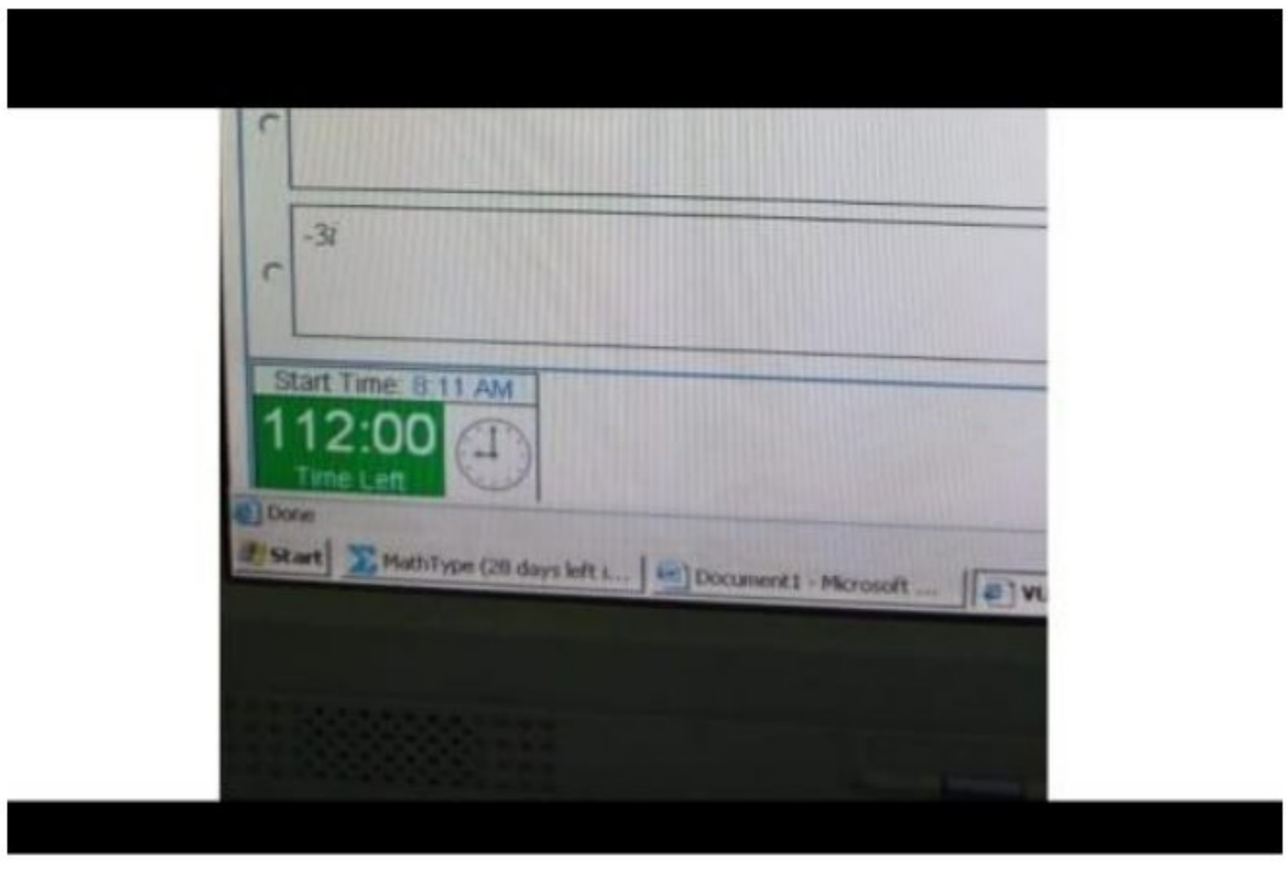
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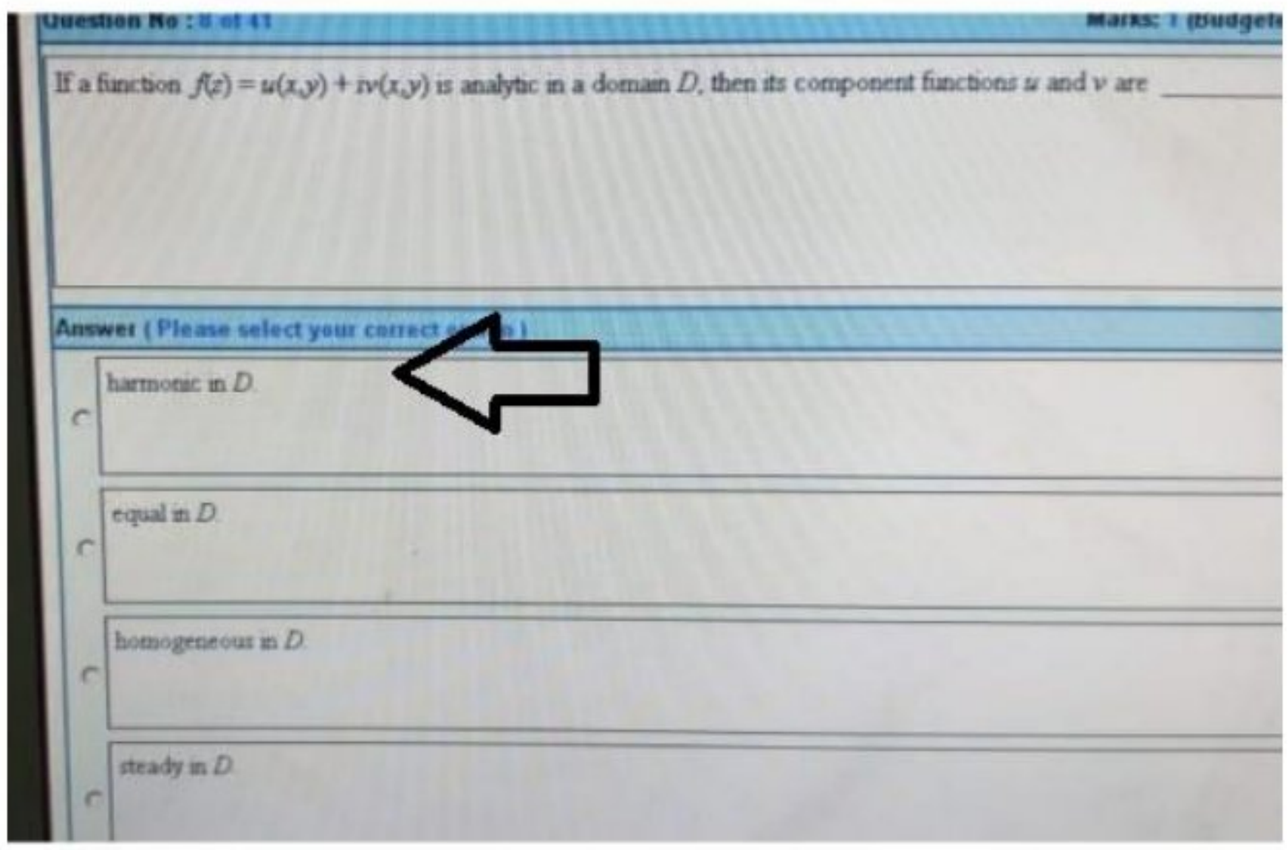


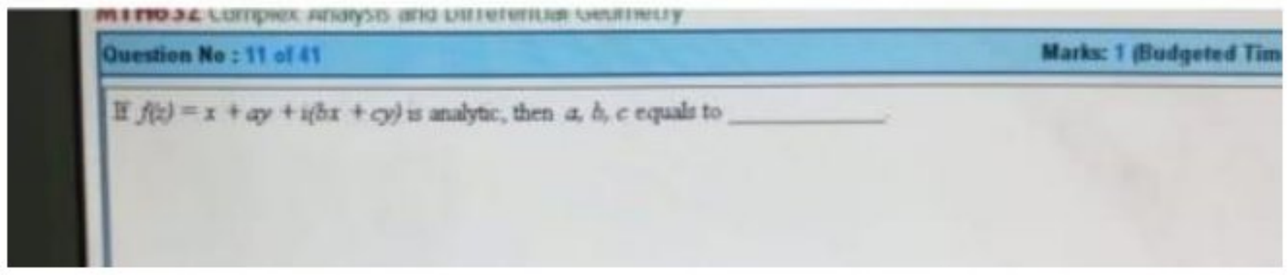




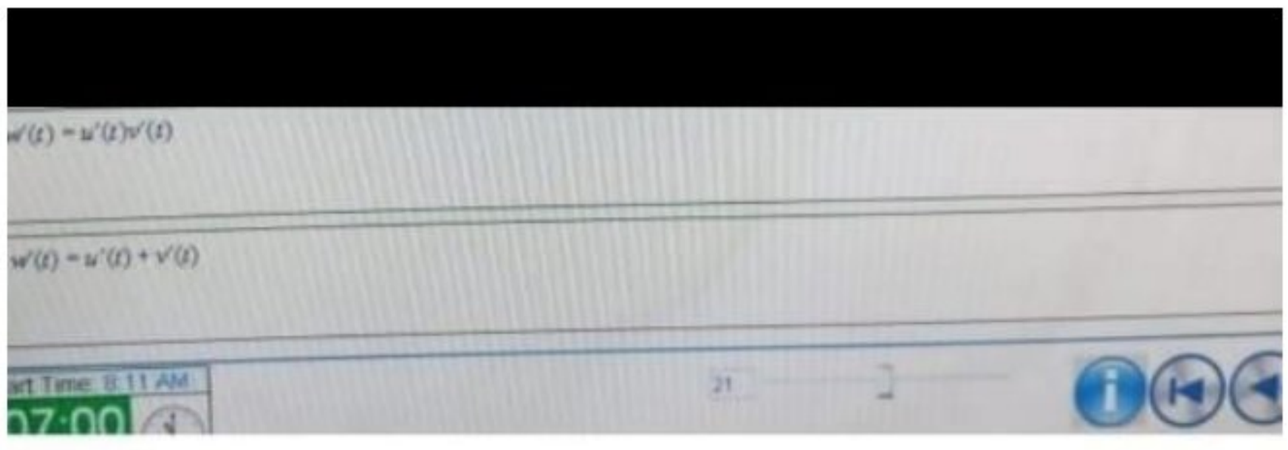
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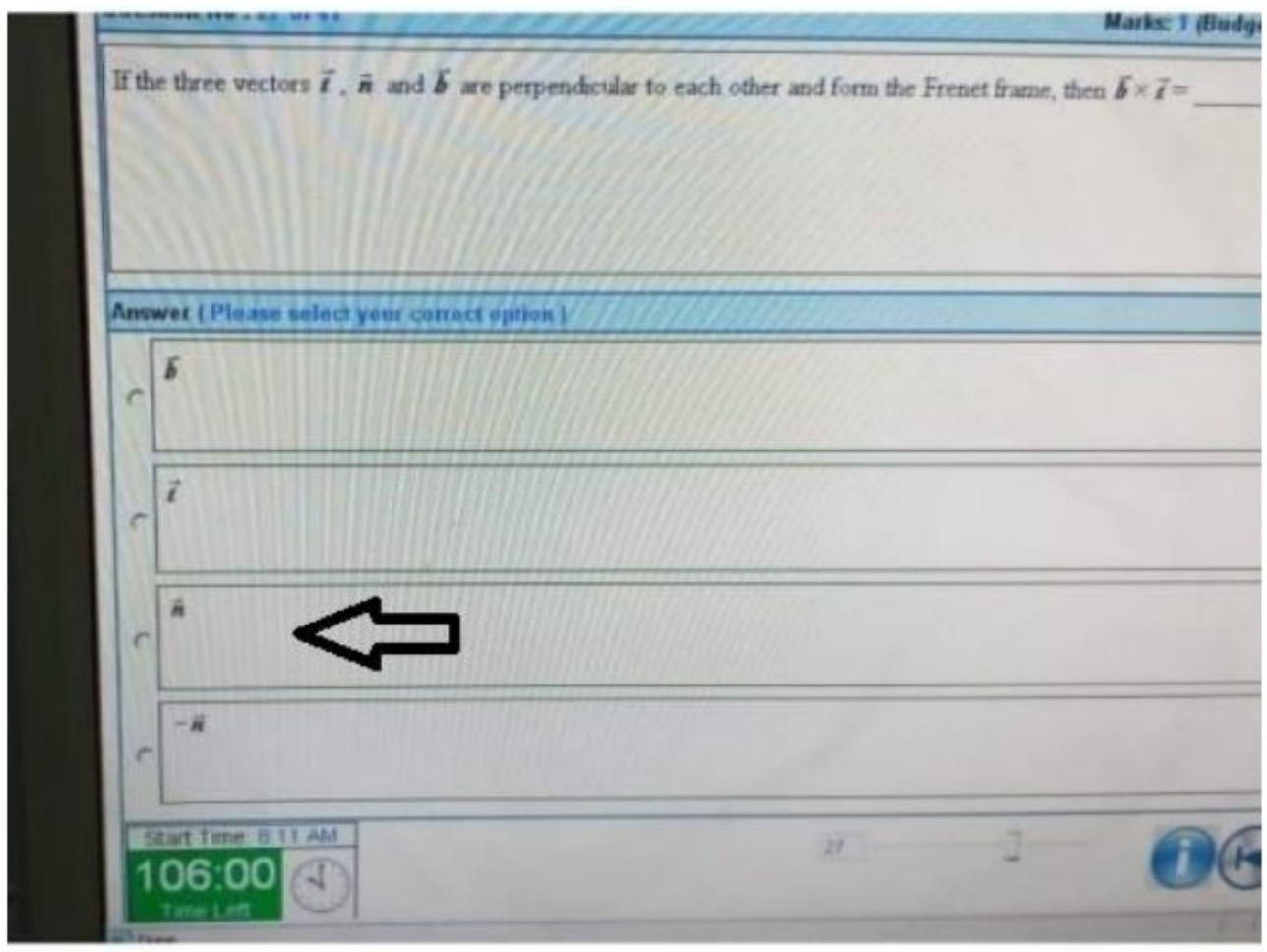


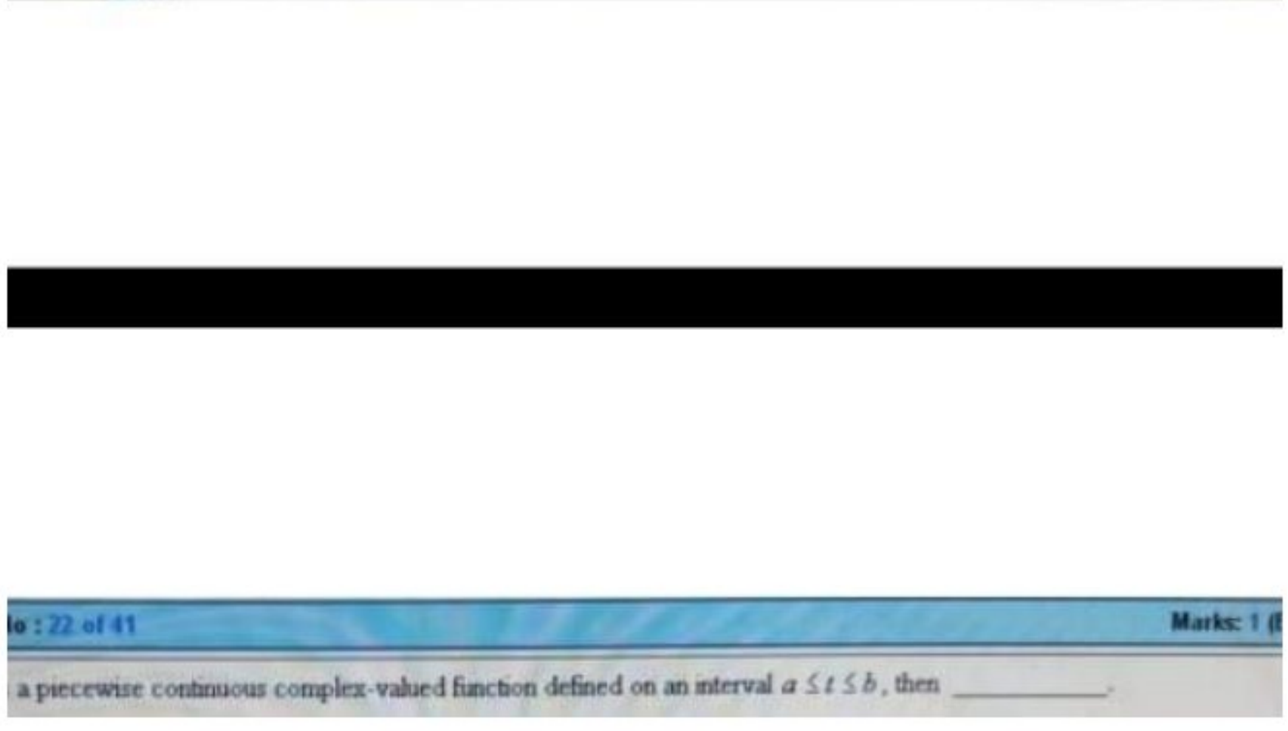




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ATH632 Complex Analysis and Differential Geometry

Question No : 6 of 41

The limit of $f(z) = 2z^2 - 4z + 2$ at $z = i$ is _____

Answer (Please select your correct option)

- 5i
- - 4i
- 2i
- -3i

Start Time: 8:11 AM

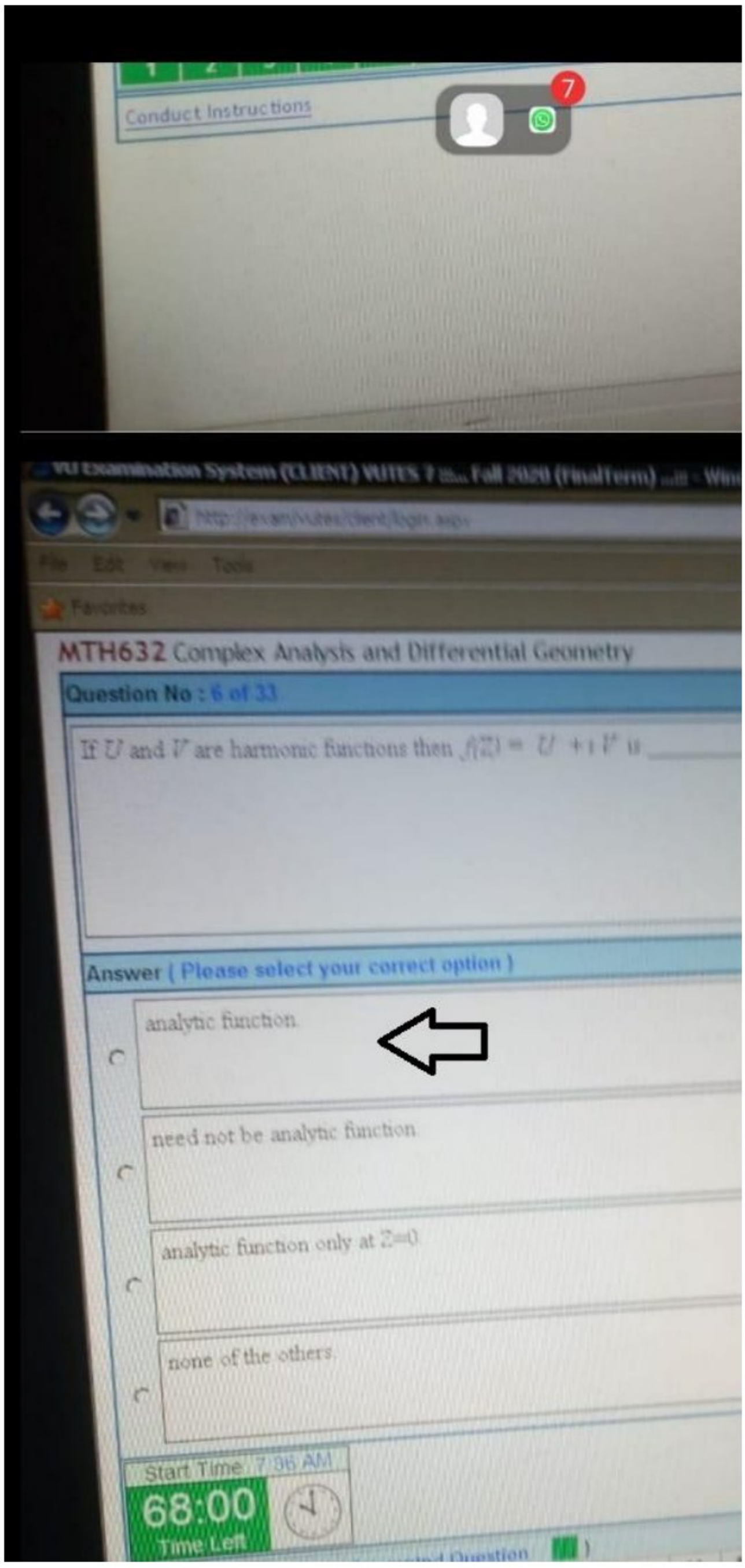
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MTH632 Complex Analysis and Differential Geometry

Question No : 6 of 33

If U and V are harmonic functions then $f(Z) = U + iV$ is _____

Answer (Please select your correct option)

- analytic function
- need not be analytic function
- analytic function only at Z=0
- none of the others

Start Time 7:36 AM

68:00
Time Left

Question Summary : (Attempted Question)

1	2	3	4	5	6	7	8	9	10	11

Conduct Instructions

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Question Summary : (Attempted Question)

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Conduct Instructions

MTH632 Complex Analysis and Differential Geometry

Question No : 2 of 33

The logarithmic function of $e^w = z$, where $z = re^{i\theta}$ and $w = u + iv$, then

Answer (Please select your correct option)

- $w = \ln r + i(\theta + 2n\pi)$
- $w = re^{i\theta}$
- $w = r + i(\theta + 2n\pi)$
- $w = \ln r + i\theta$

Start Time 7:35 AM

78:00 Time Left

Question Summary (Attempted Question)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

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Question Summary : (Attempted Question)

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Conduct Instructions

MTH632 Complex Analysis and Differential Geometry

Question No : 2 of 33

The logarithmic function of $e^w = z$, where $z = re^{i\theta}$ and $w = u + iv$, then

Answer (Please select your correct option)

- $w = \ln r + i(\theta + 2n\pi)$
- $w = re^{i\theta}$
- $w = r + i(\theta + 2n\pi)$
- $w = \ln r + i\theta$

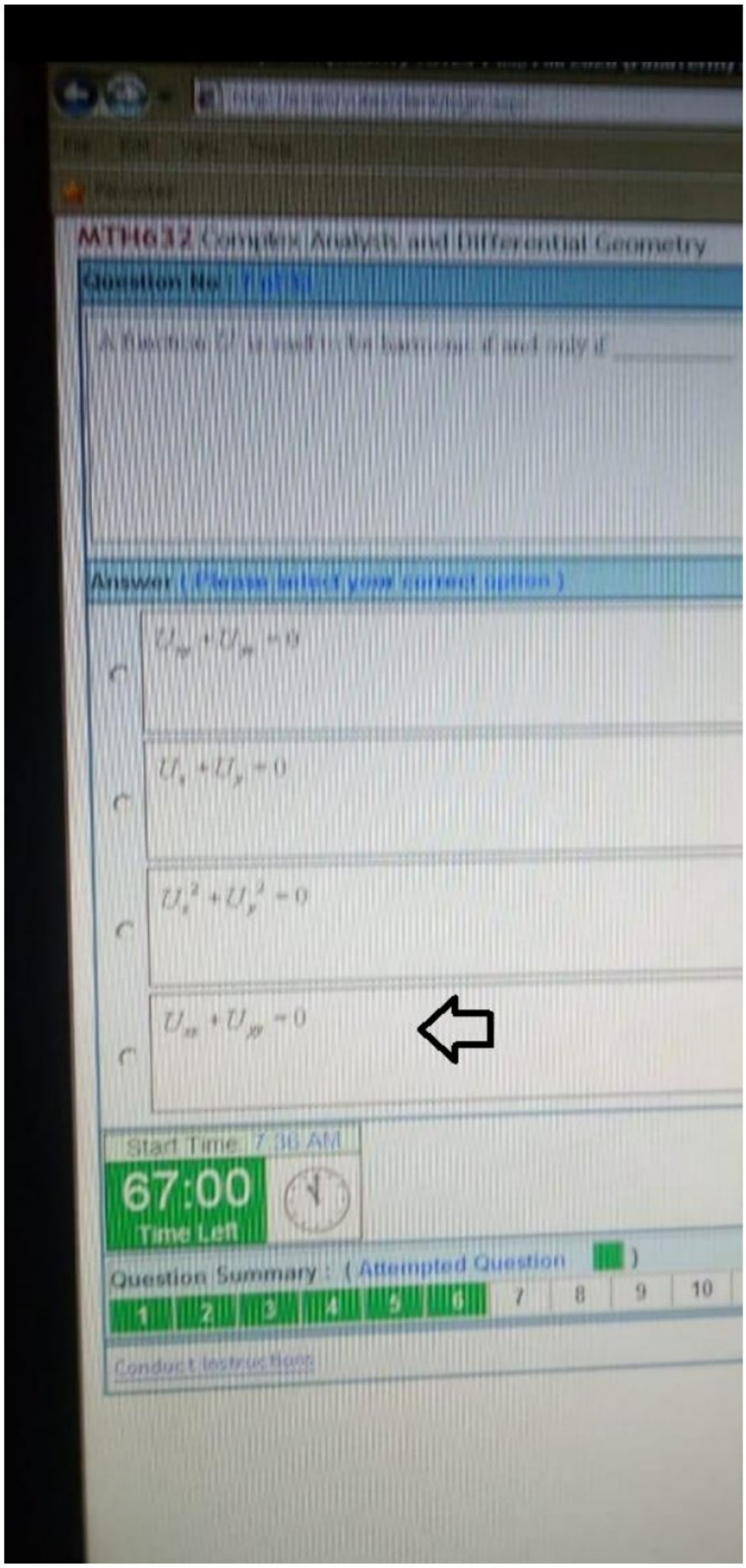
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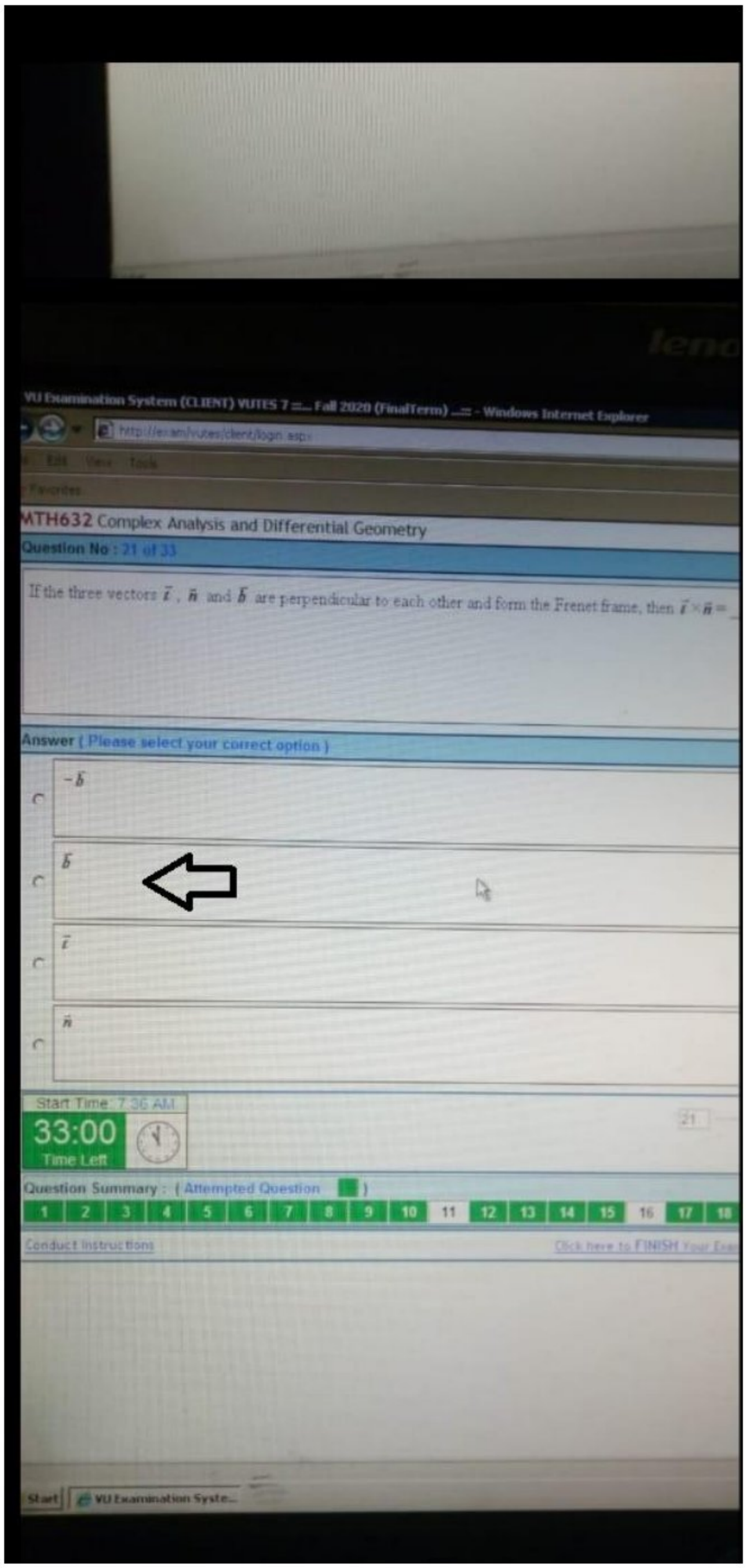
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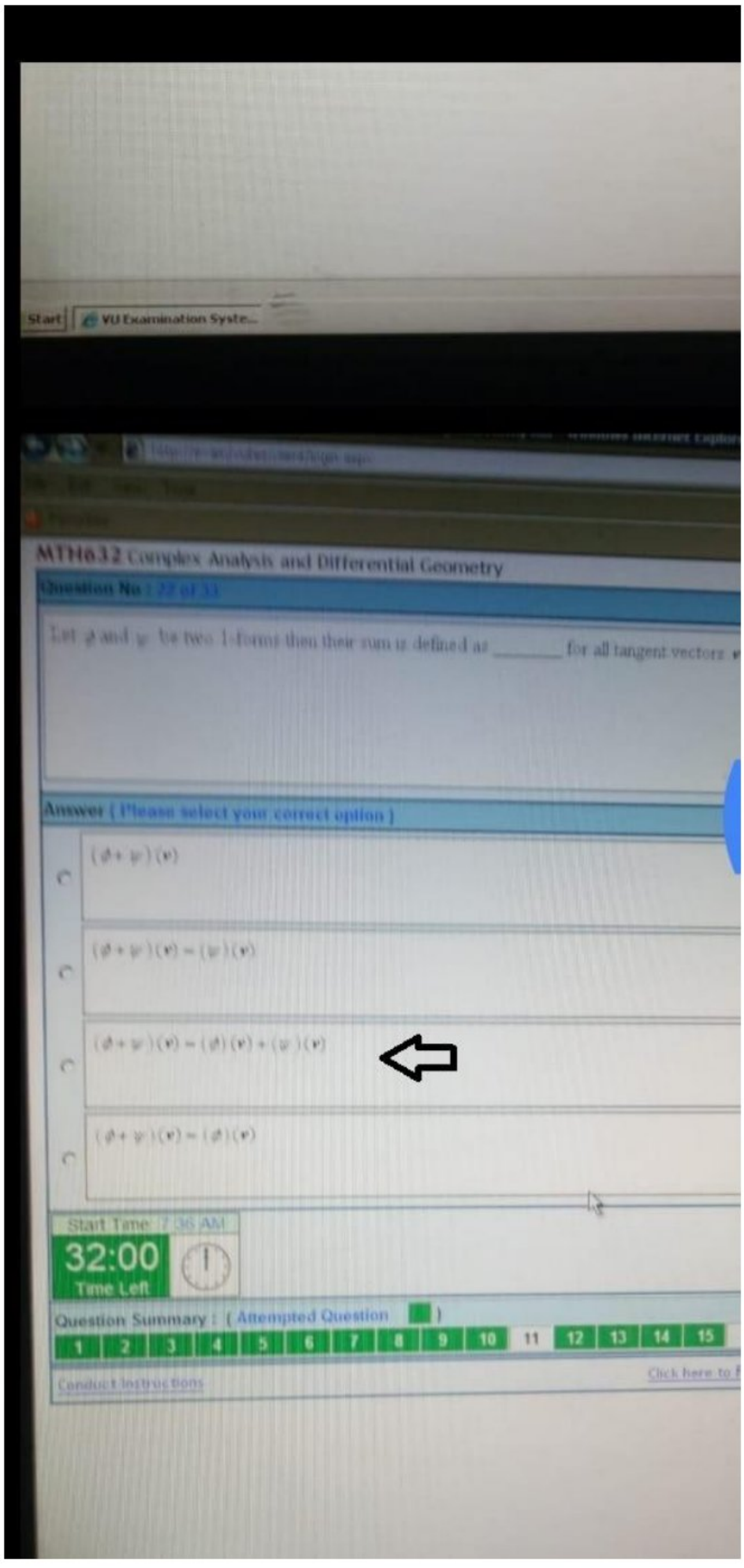
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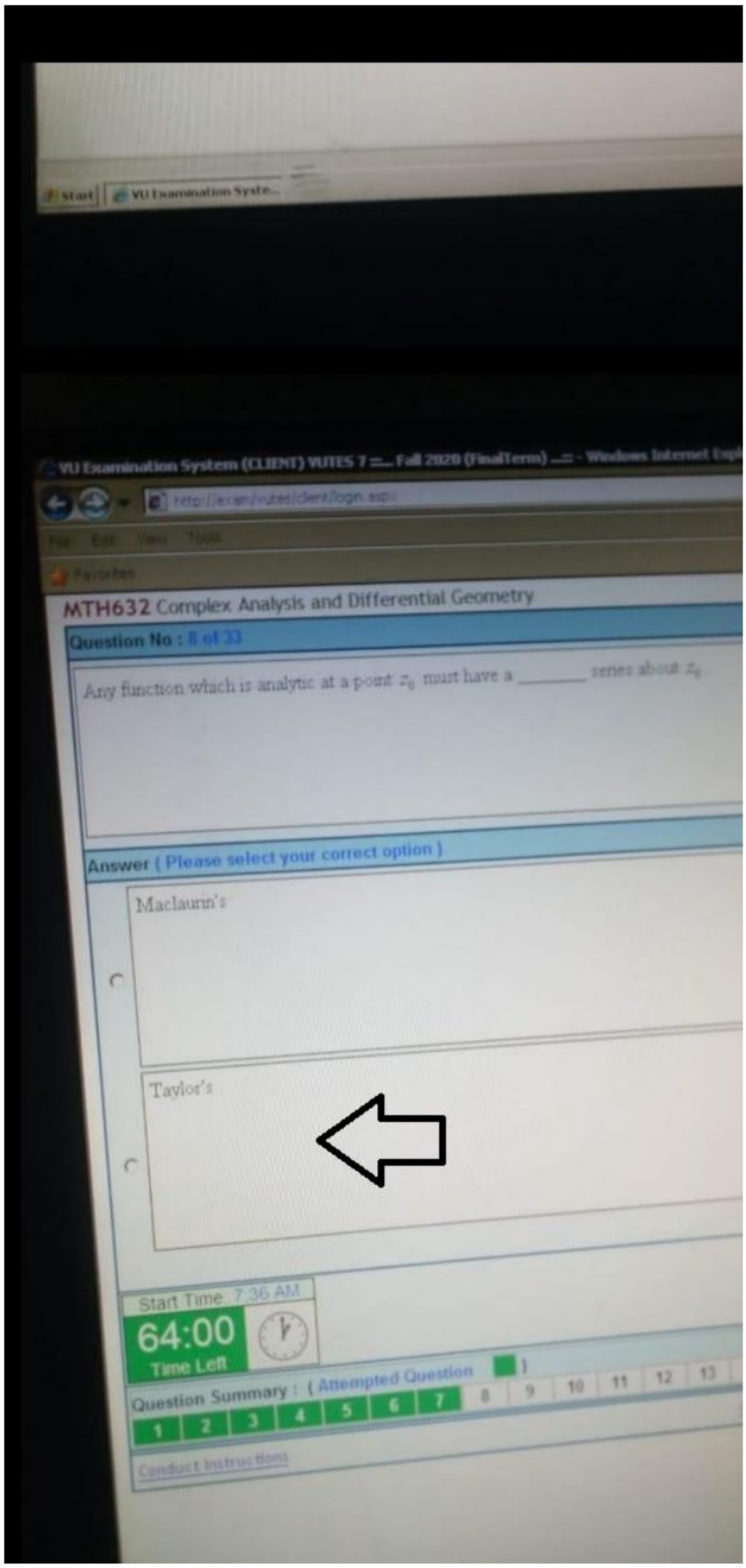
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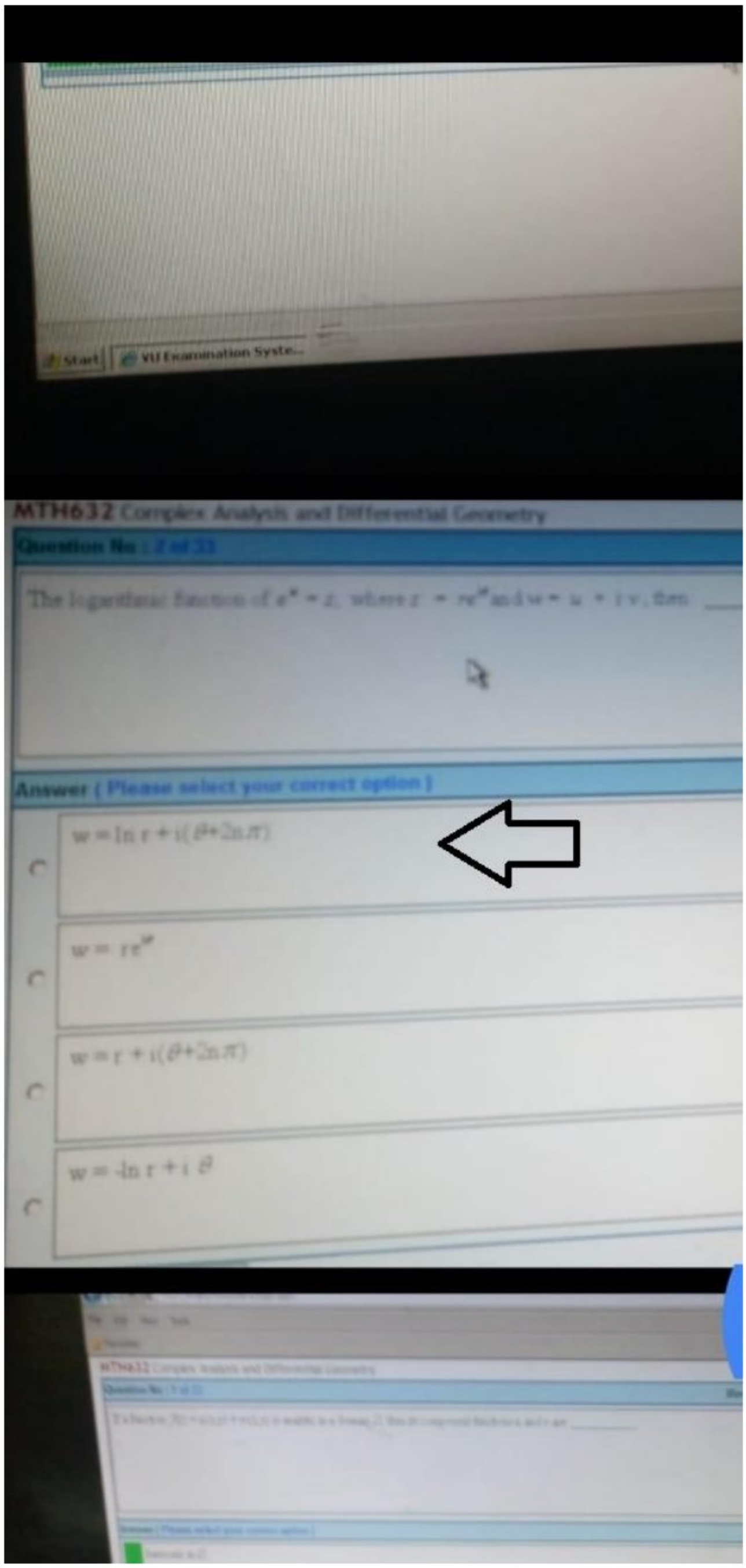
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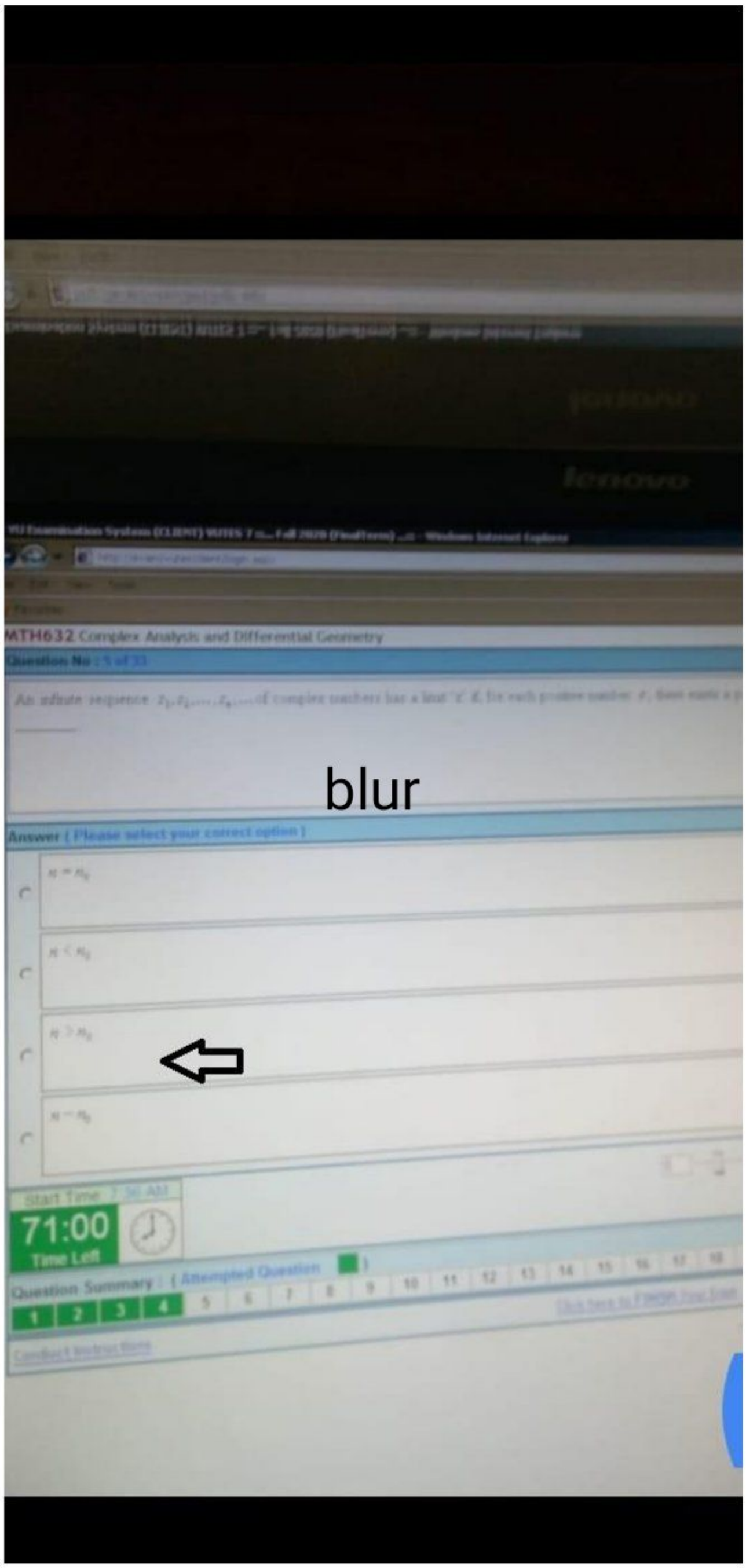
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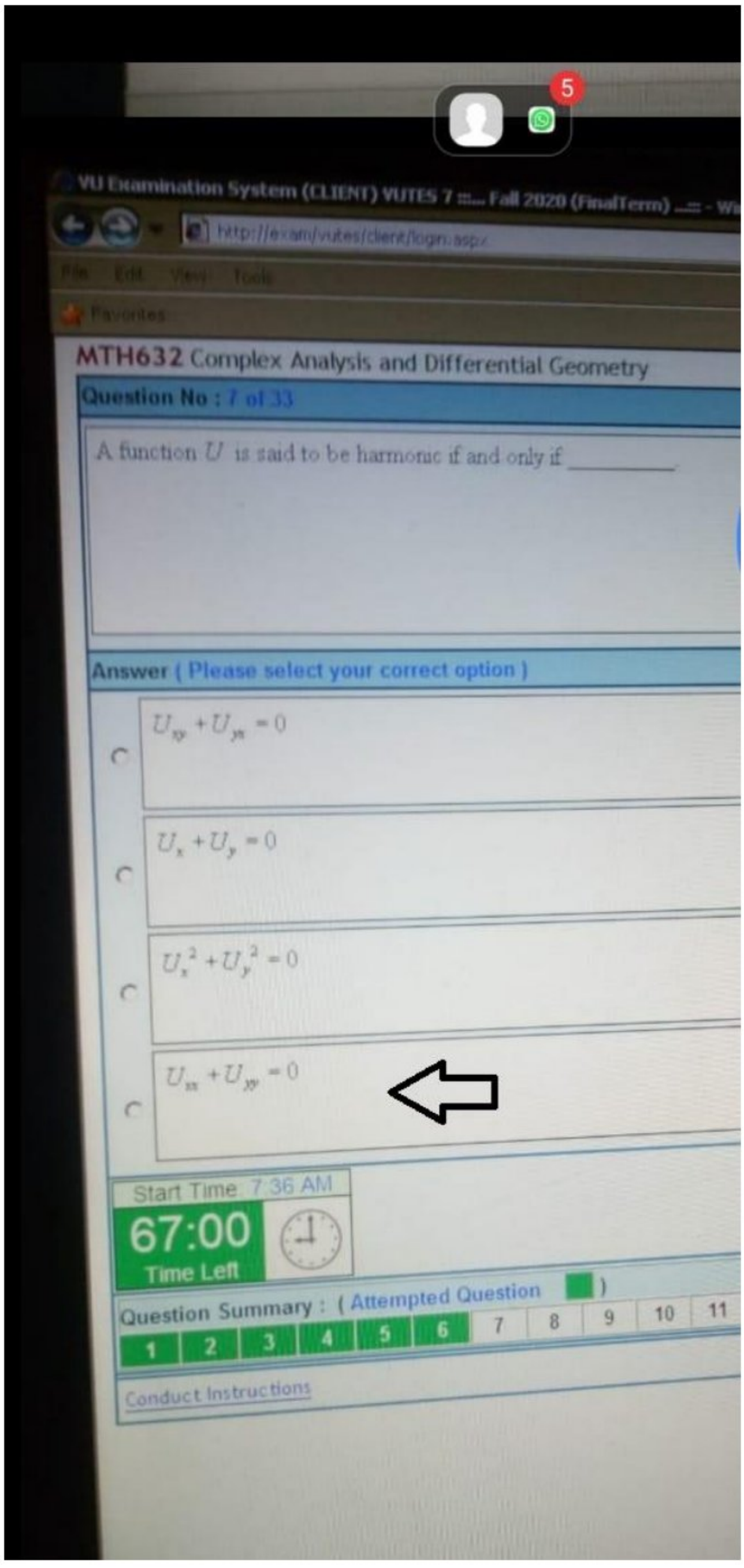


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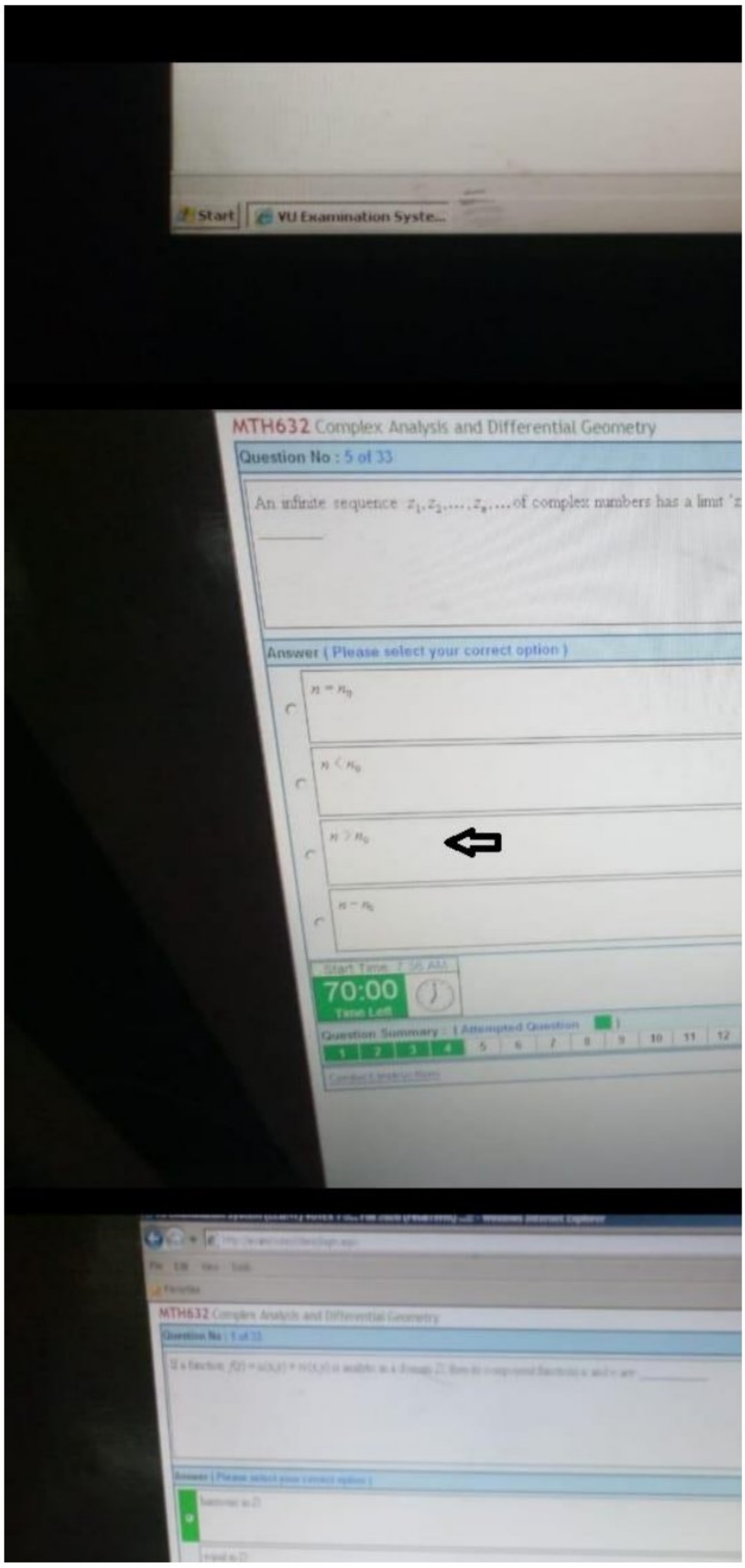


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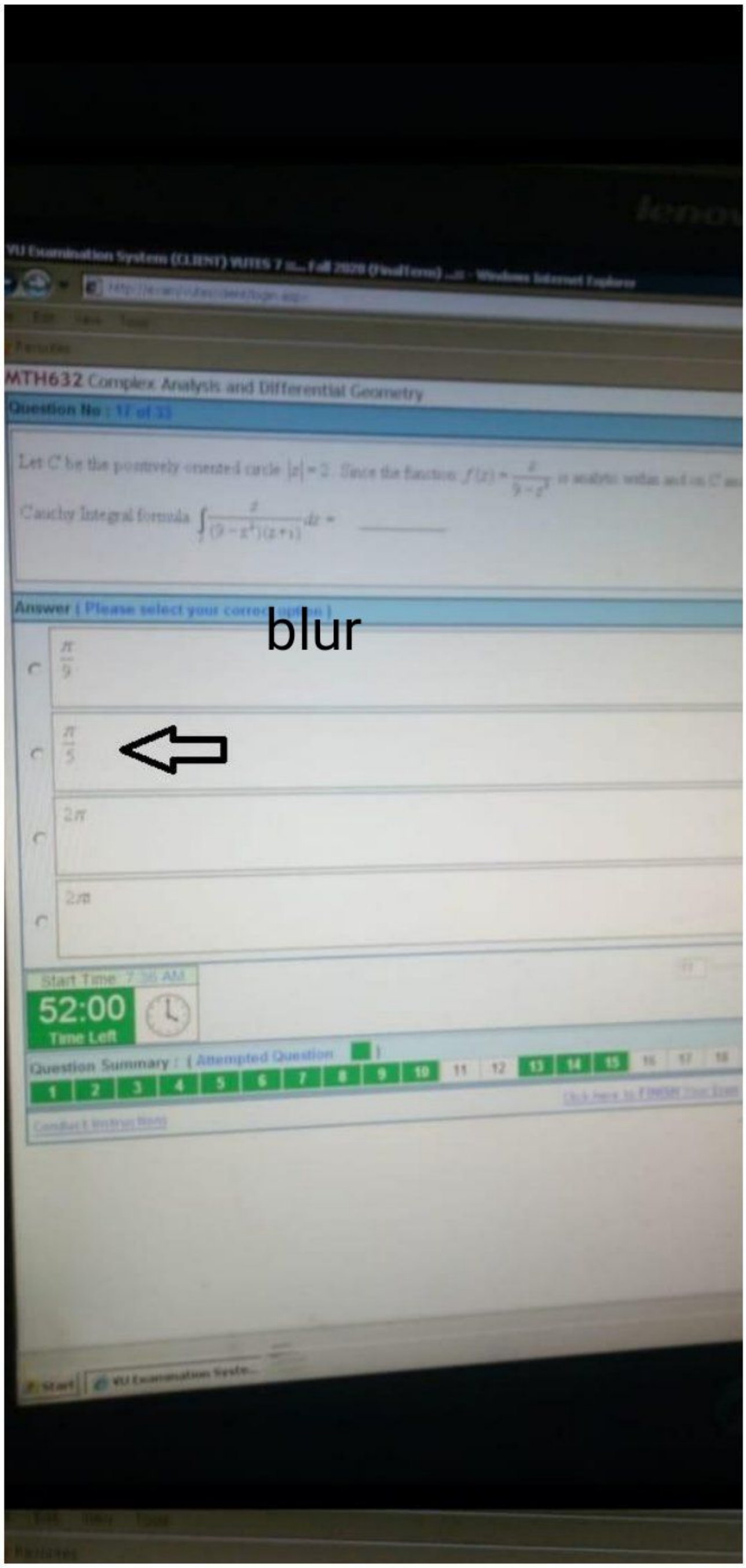
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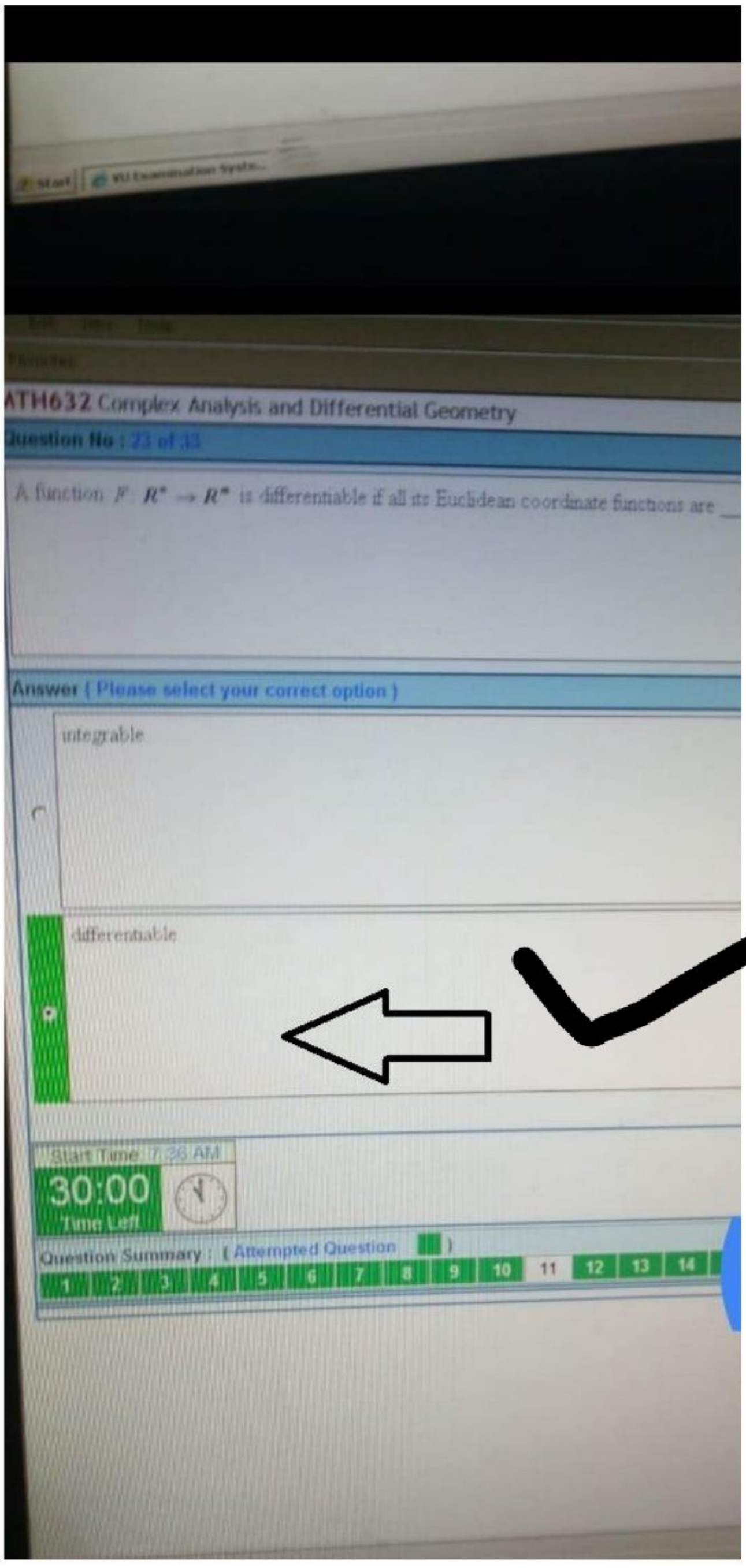
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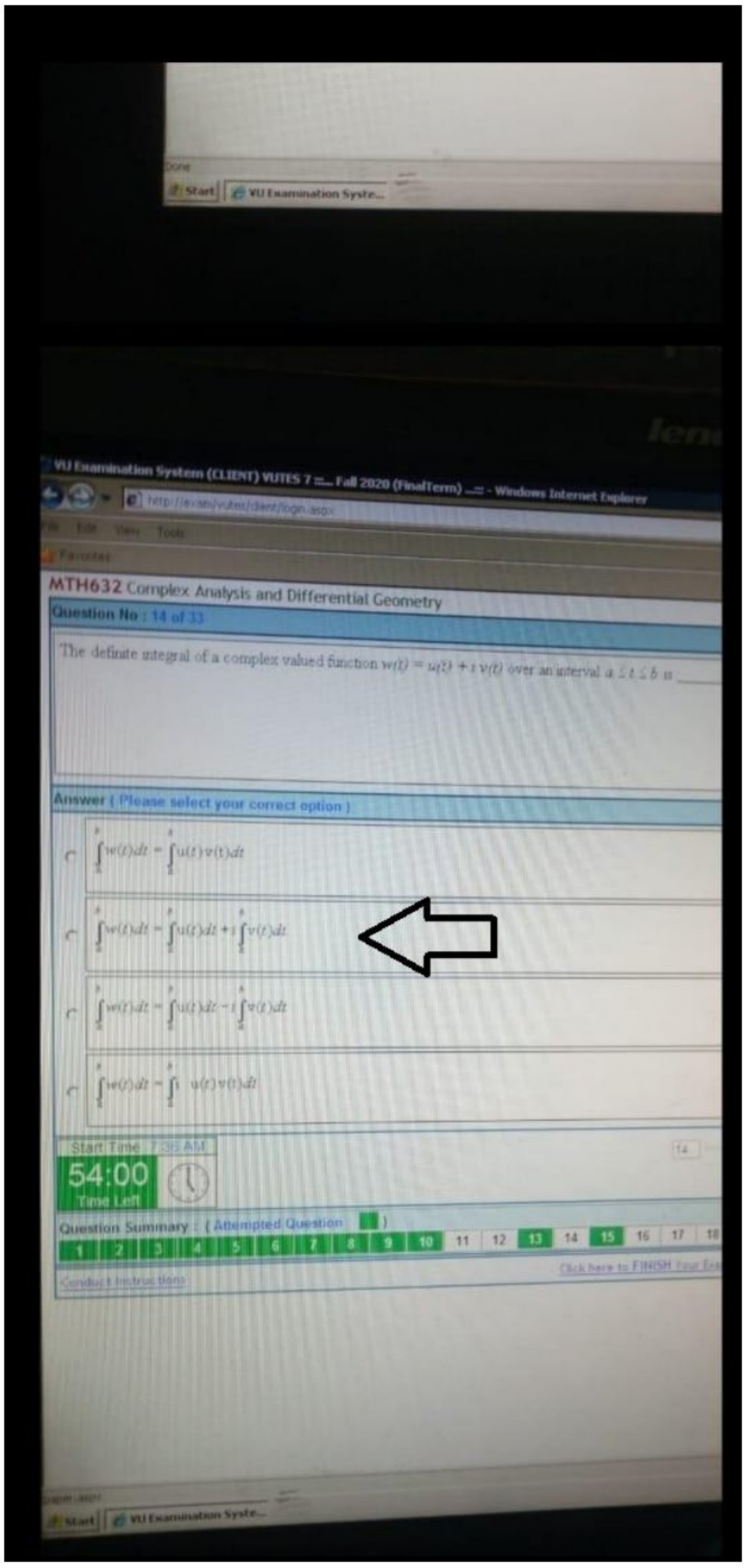
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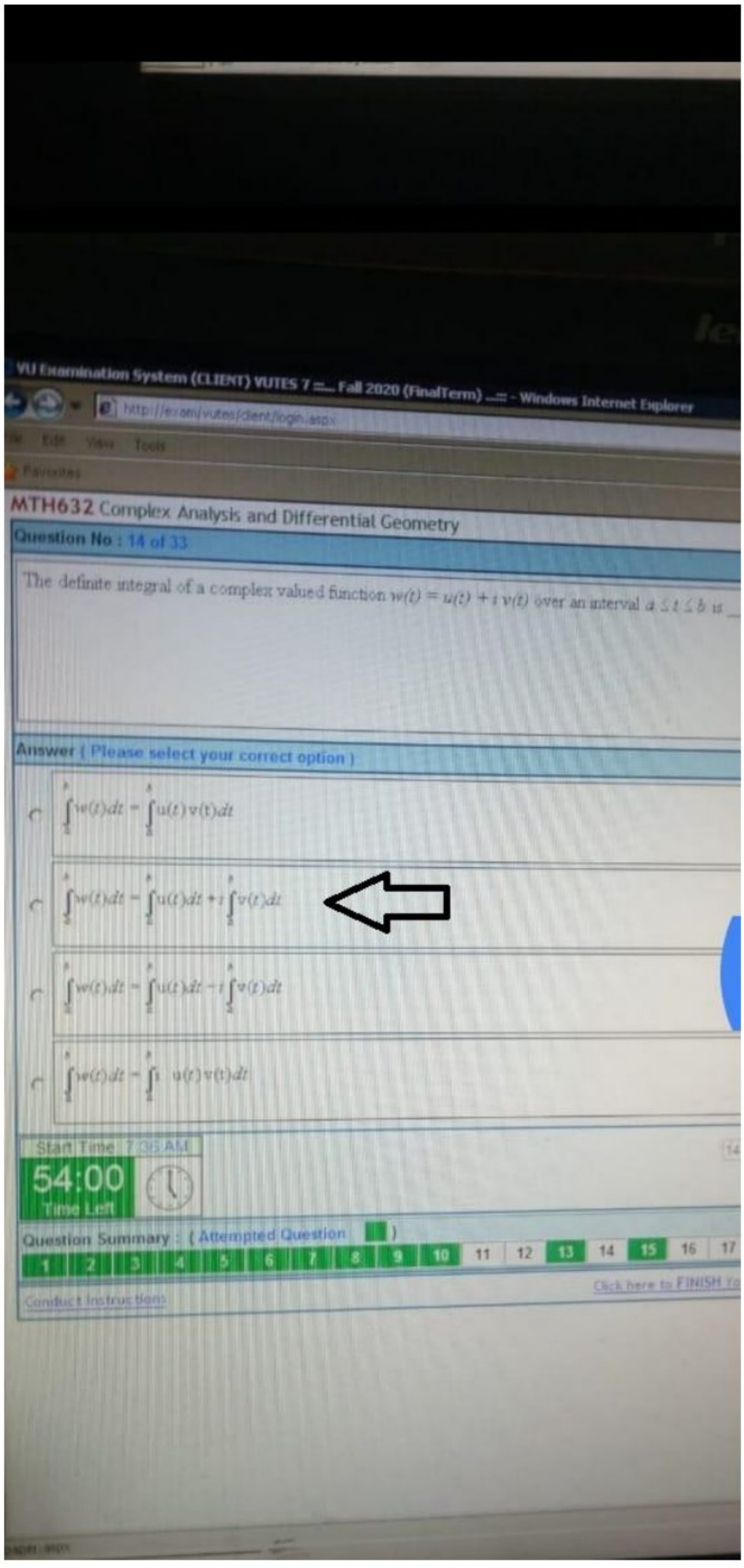
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Question No

The sequence $z_n = -2 + i\frac{1}{n^3}$ $(n = 1, 2, 3, \ldots)$ for $n \to \infty$ converges to _____

Answer (Please select your correct option)

- i
- -1
- 1
- -2

Start Time: 7:36 AM

MTH632 Complex Analysis and Differential Geometry

Question No : 11 of 33

The principal value of 1^{2i} is _____

Answer (Please select your correct option)

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17 / 25

1

-2

Start Time 7:36 AM

MTH632 Complex Analysis and Differential Geometry

Question No : 11 of 33

The principal value of 1^{2i} is _____

Answer (Please select your correct option)

0

1

i

2i

Start Time 7:36 AM

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Question Summary : (Attempted Question)

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1

-2

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MTH632 Complex Analysis and Differential Geometry

Question No : 11 of 33

The principal value of 1^{2i} is _____

Answer (Please select your correct option)

0

1

i

2i

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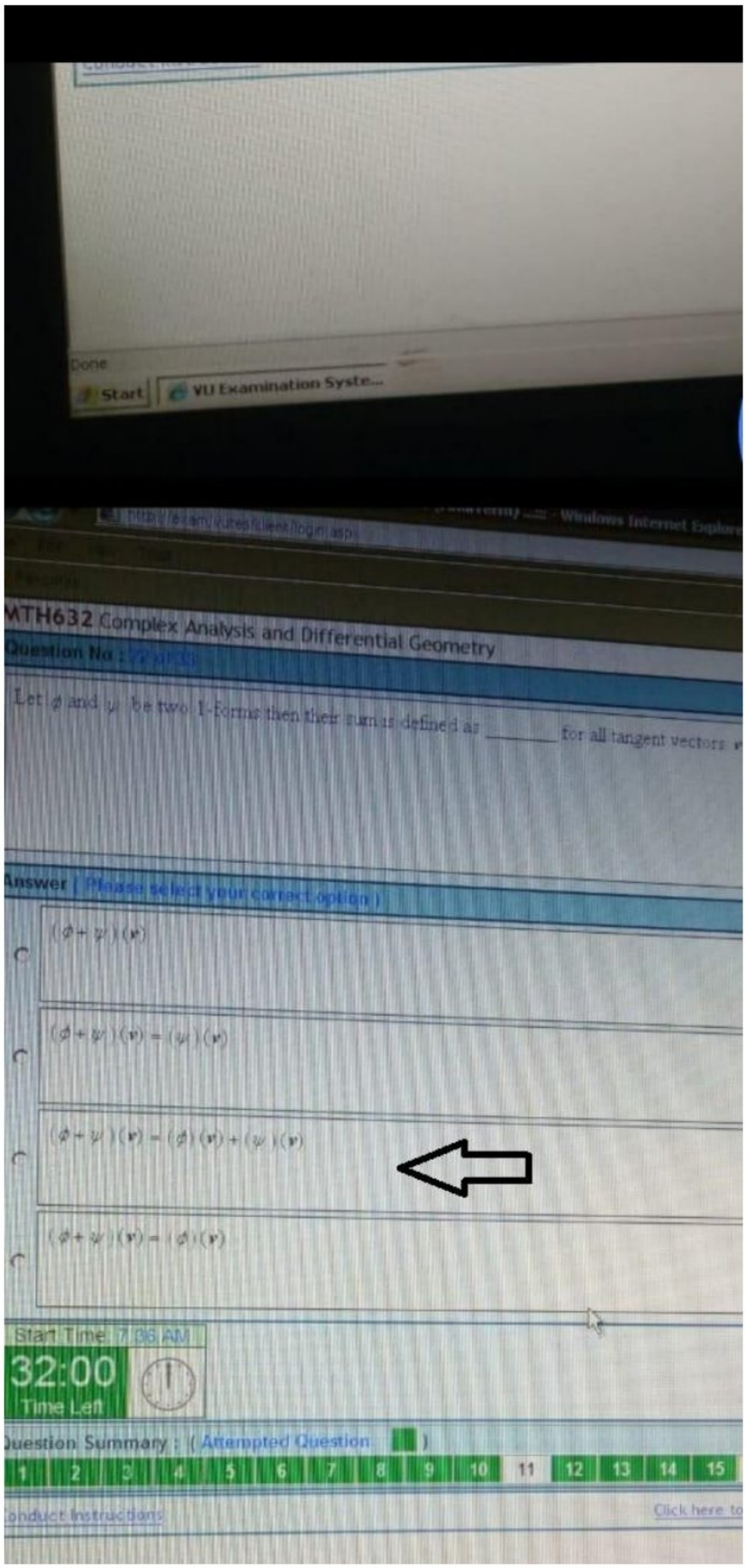
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Question Summary : (Attempted Question)

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TH632 Complex Analysis and Differential Geometry

uestion No : 13 of 33

The circle $z = e^{-i\theta}$, $0 \le \theta \le 2\pi$ is oriented in _____

Answer (Please select your correct option)

- upward
- downward
- counter-clockwise
- clockwise

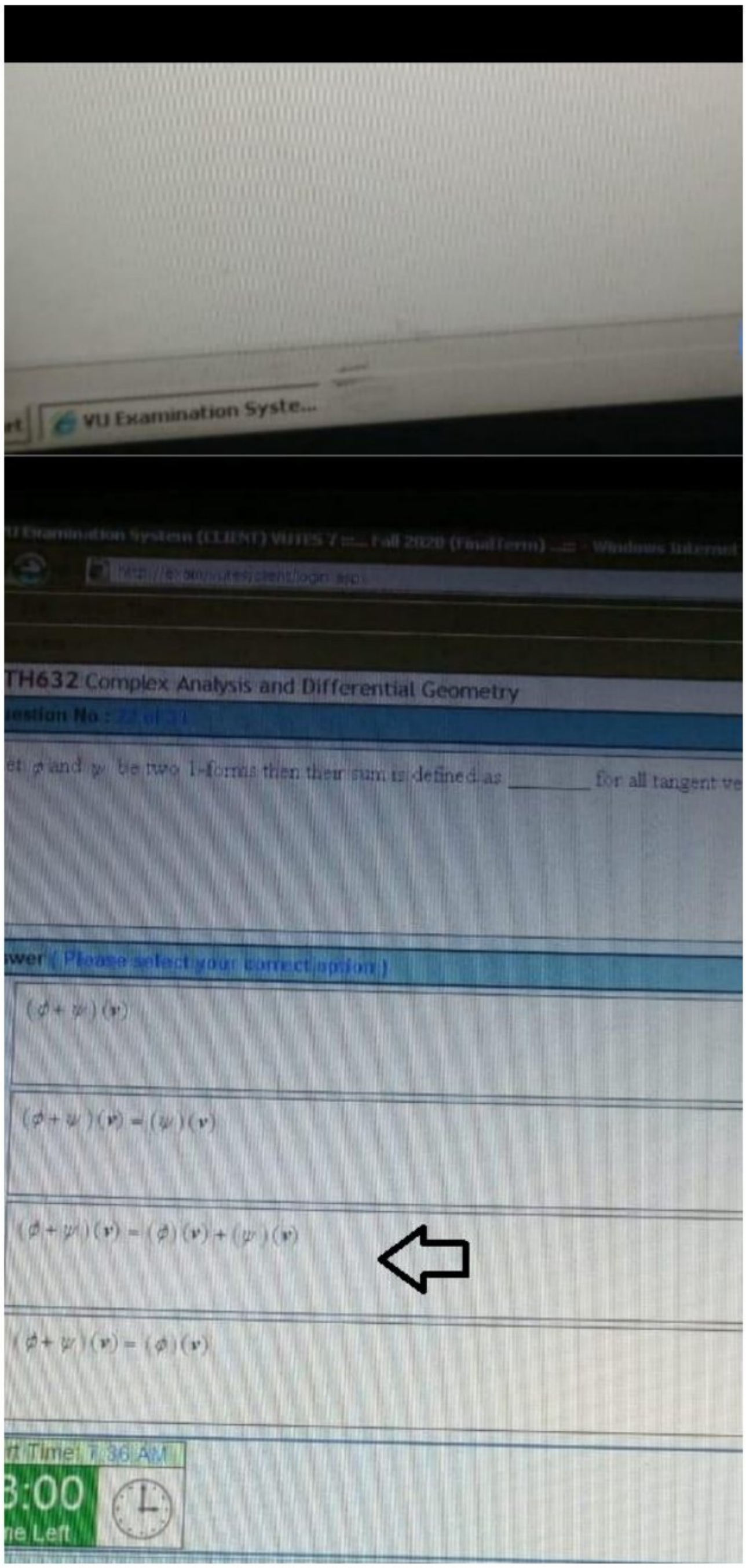
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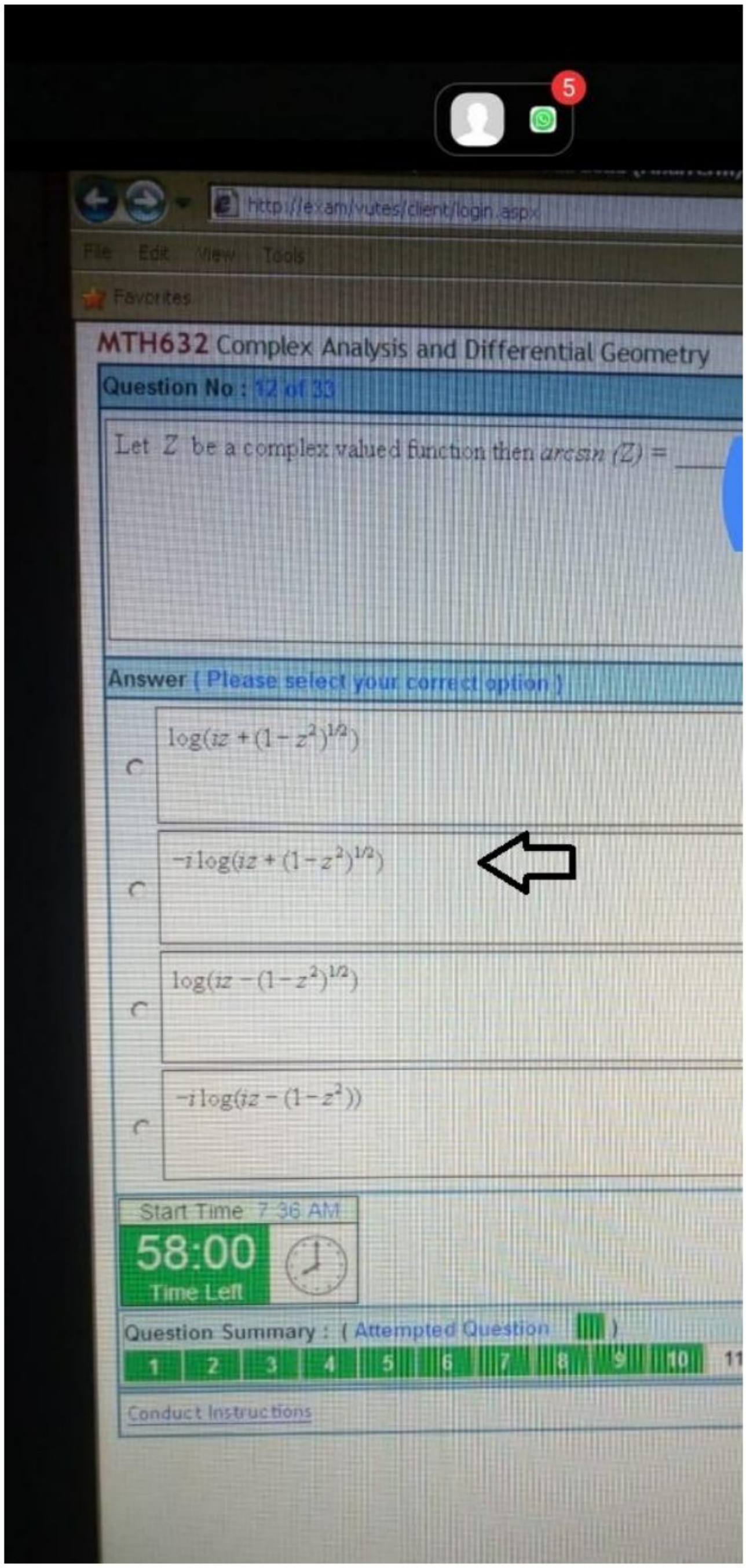
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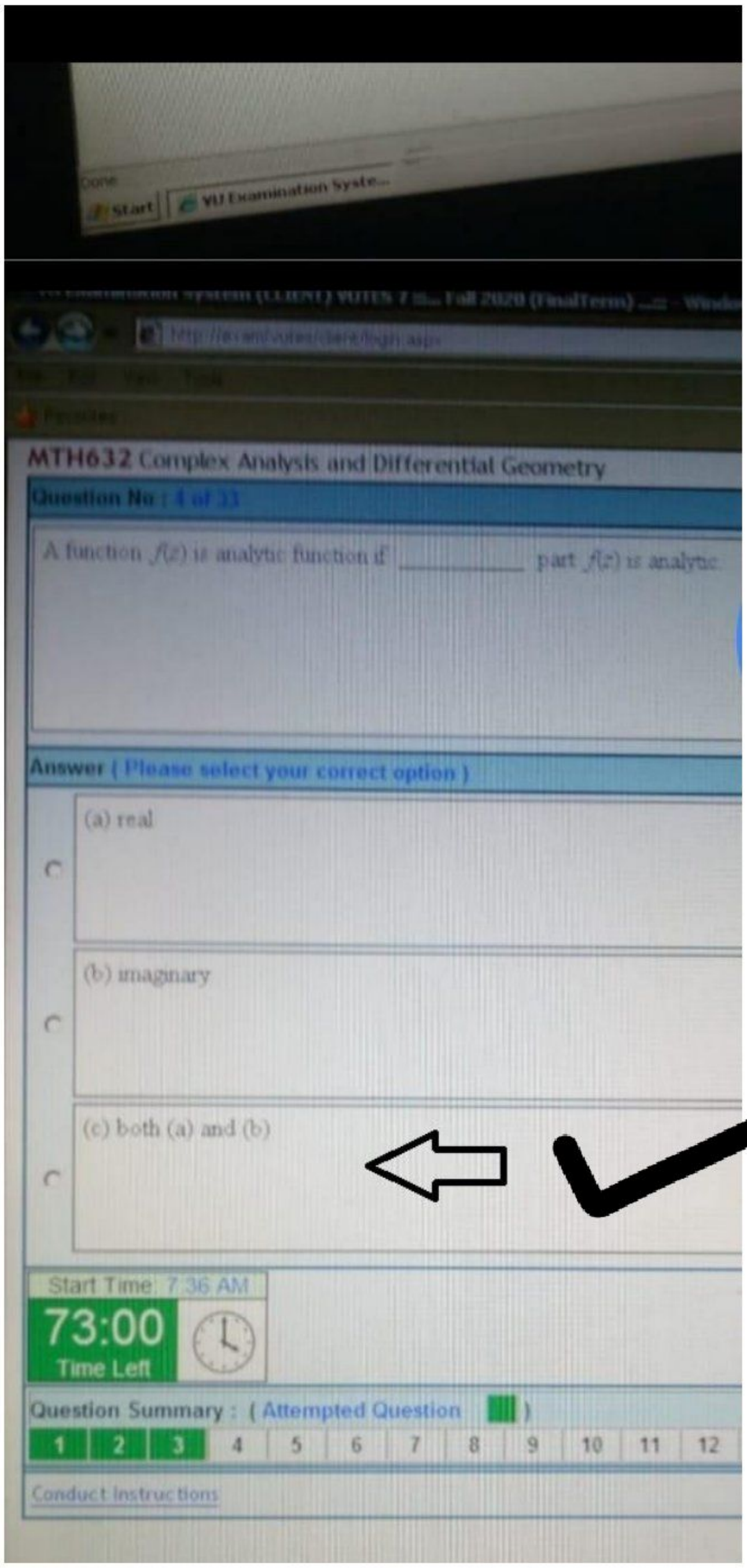
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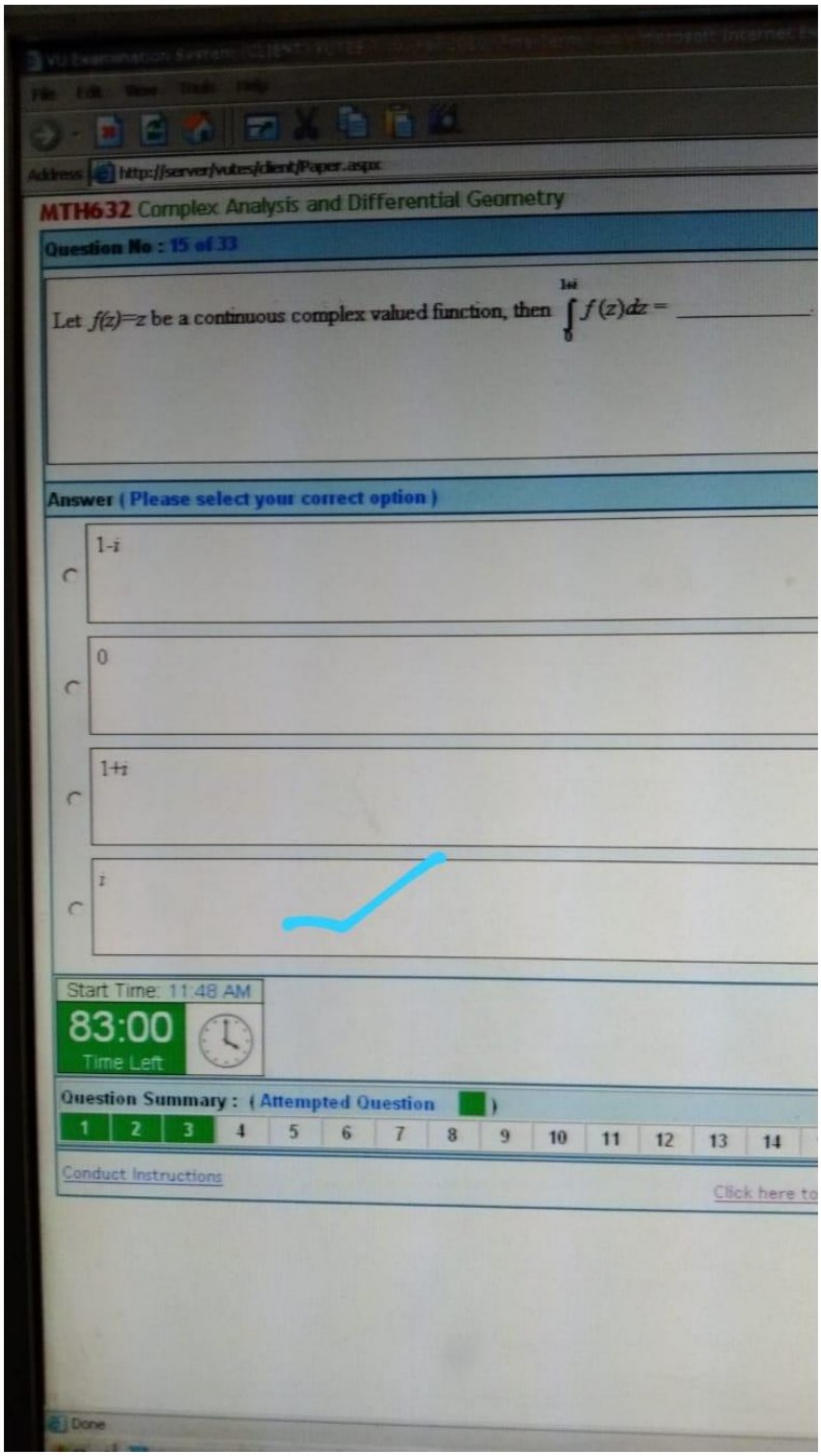
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MTH632 Complex Analysis and Differential Geometry

Question No :

Let ϕ and ψ be two 1-forms then their sum is defined as _____ for all tangent vectors v.

Answer (Please select your correct option)

- $(\phi+\psi)(v)$
- $(\phi+\psi)(v)=(\psi)(v)$
- $(\phi+\psi)(v)=(\phi)(v)+(\psi)(v)$
- $(\phi+\psi)(v)=(\phi)(v)$

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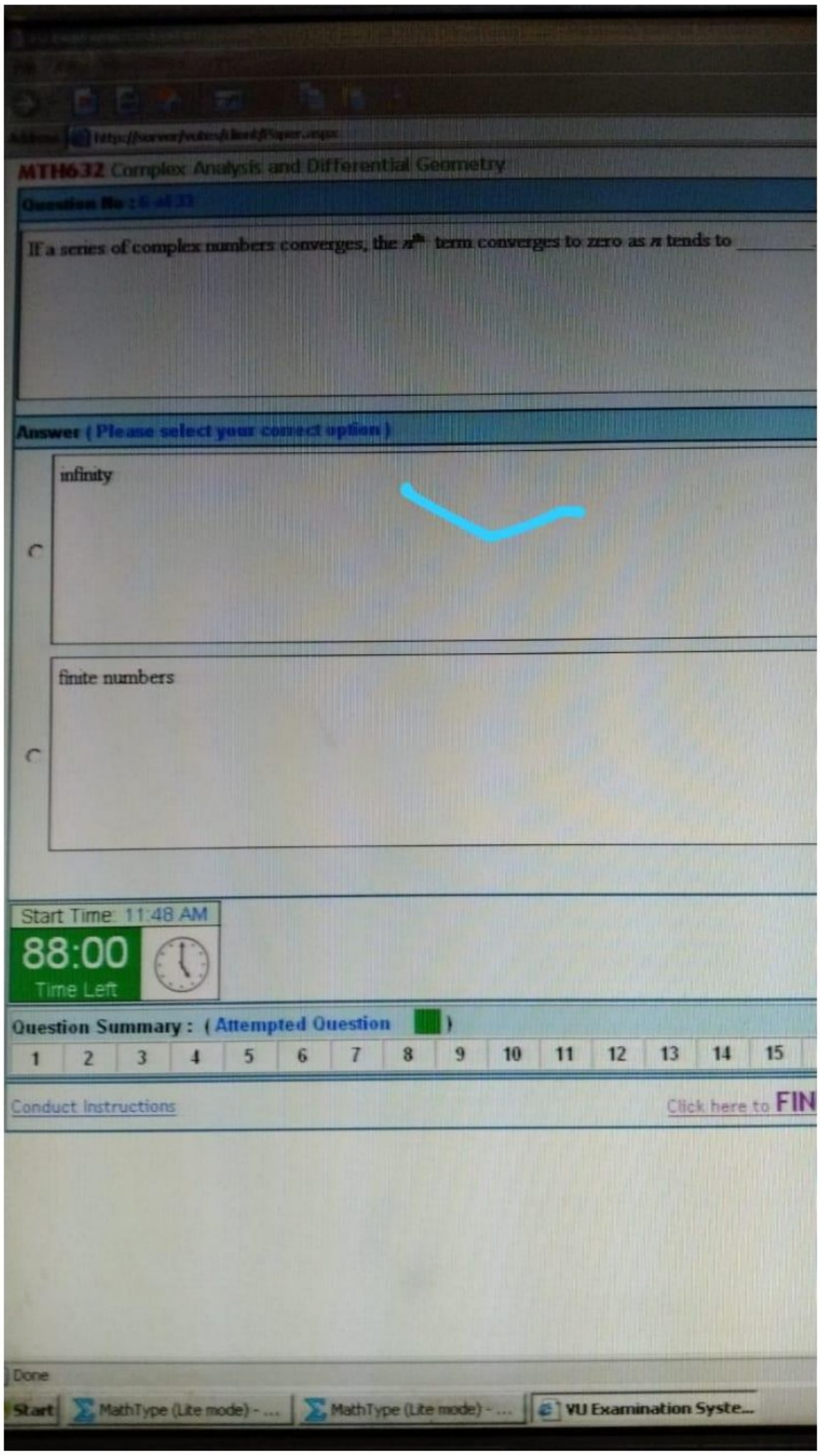
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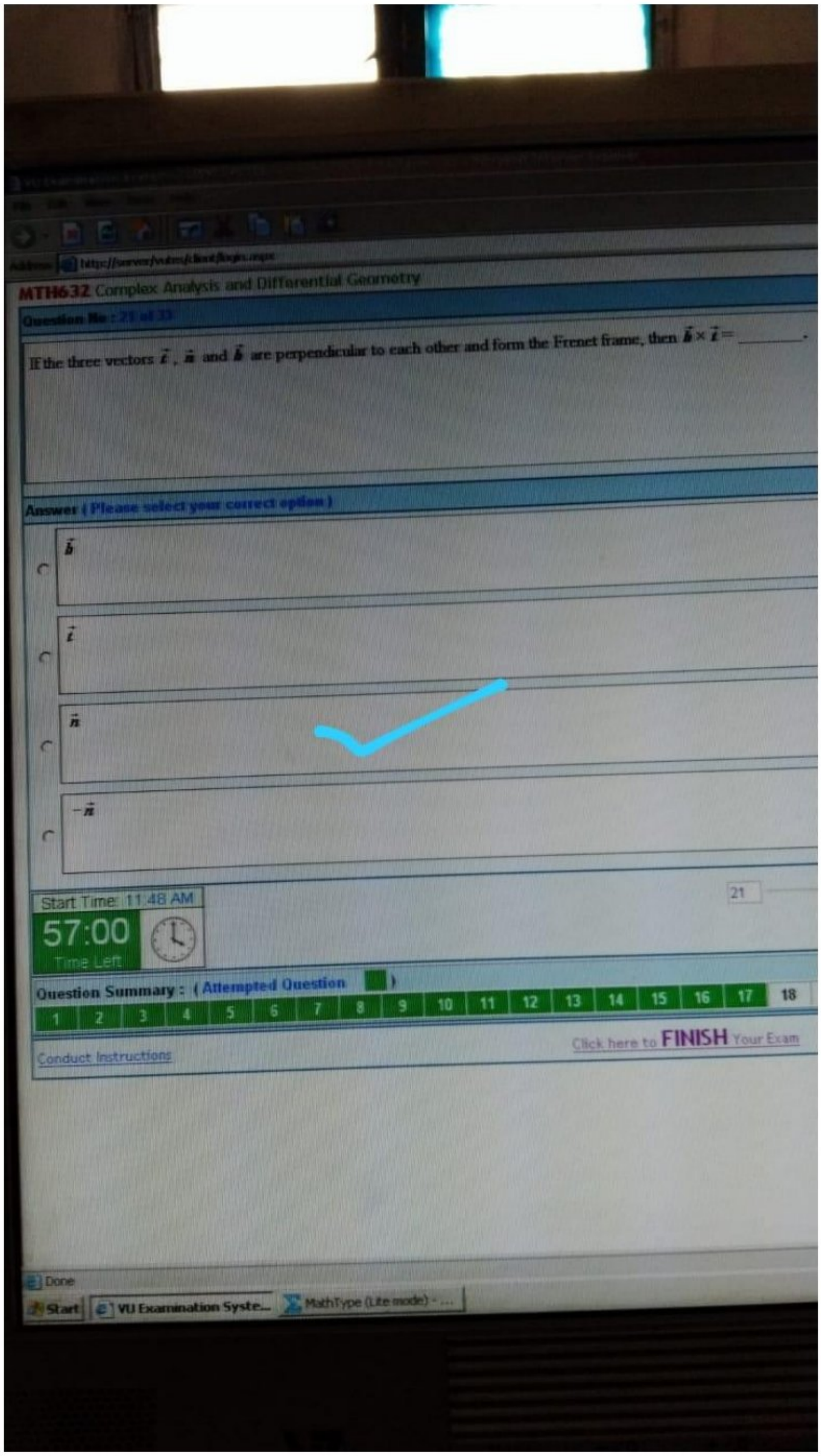
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MTH632 Complex Analysis and Differential Geometry

If the three vectors $\vec{t}$, $\vec{n}$ and $\vec{b}$ are perpendicular to each other and form the Frenet frame, then $\vec{b} \times \vec{t} =$

Answer (Please select your correct option)

- $\vec{b}$
- $\vec{t}$
- $\vec{n}$
- $-\vec{n}$

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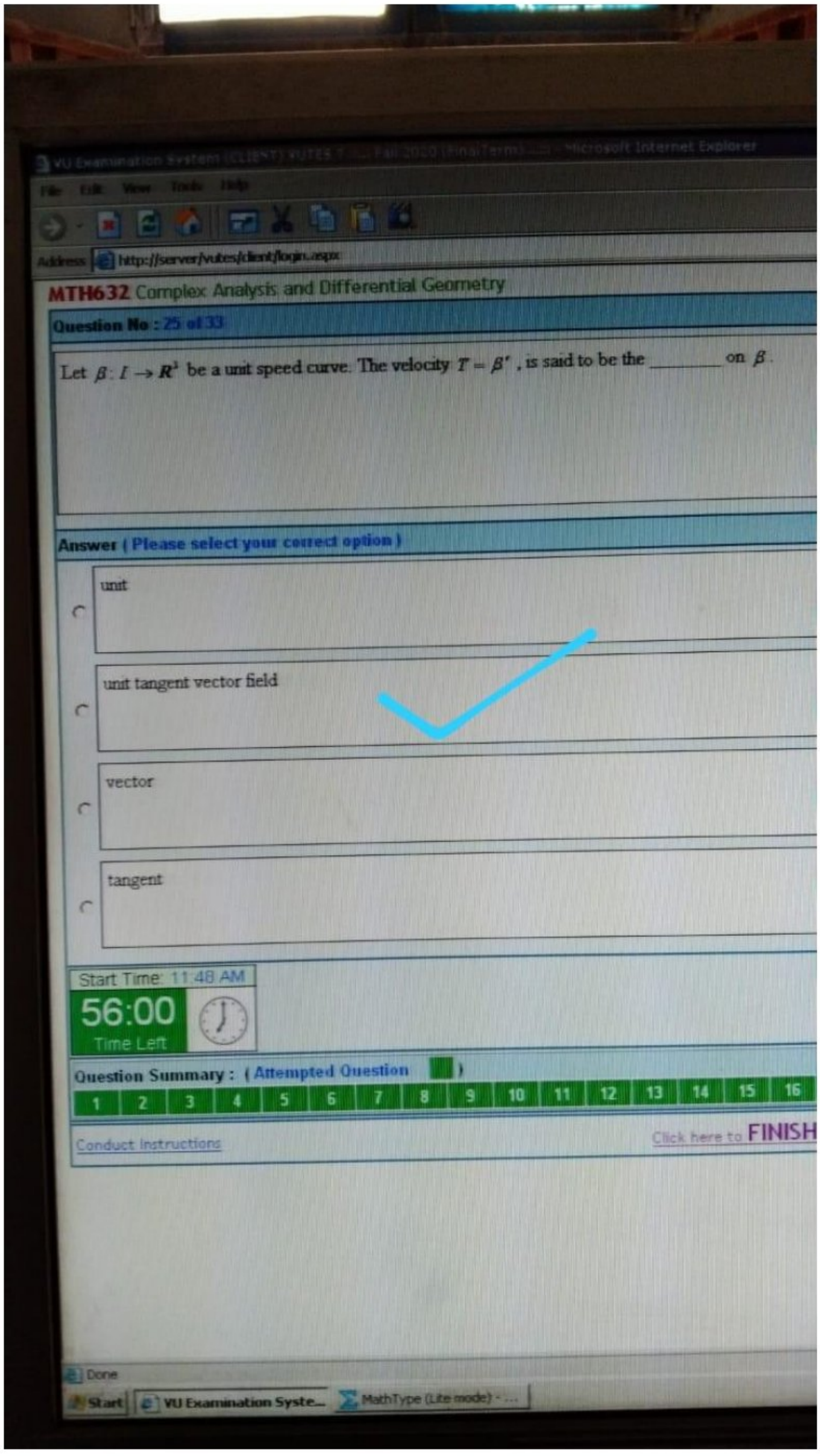
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MTH632 Complex Analysis and Differential Geometry

Question No : 11 of 20

The principal value of 1^{2i} is _____.

Answer (Please select your correct option)

- 0
- 1
- i
- 2i

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Question Summary : (Attempted Question)

1	2	3	4	5	6	7	8	9	10

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MTH632 Complex Analysis and Differential Geometry

Question No : 17 of 33

By using the Extension of Cauchy Integral formula $\int_C \frac{f(z)}{(z-z_0)^{n+1}} dz =$ _____

Answer (Please select your correct option)

- $f^{(n)}(z_0)$
- $2\pi i\, f^{(n)}(z_0)$
- $\frac{f^{(n)}(z_0)}{n!}$
- $\frac{2\pi i}{n!} f^{(n)}(z_0)$

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Question Summary : (Attempted Question)

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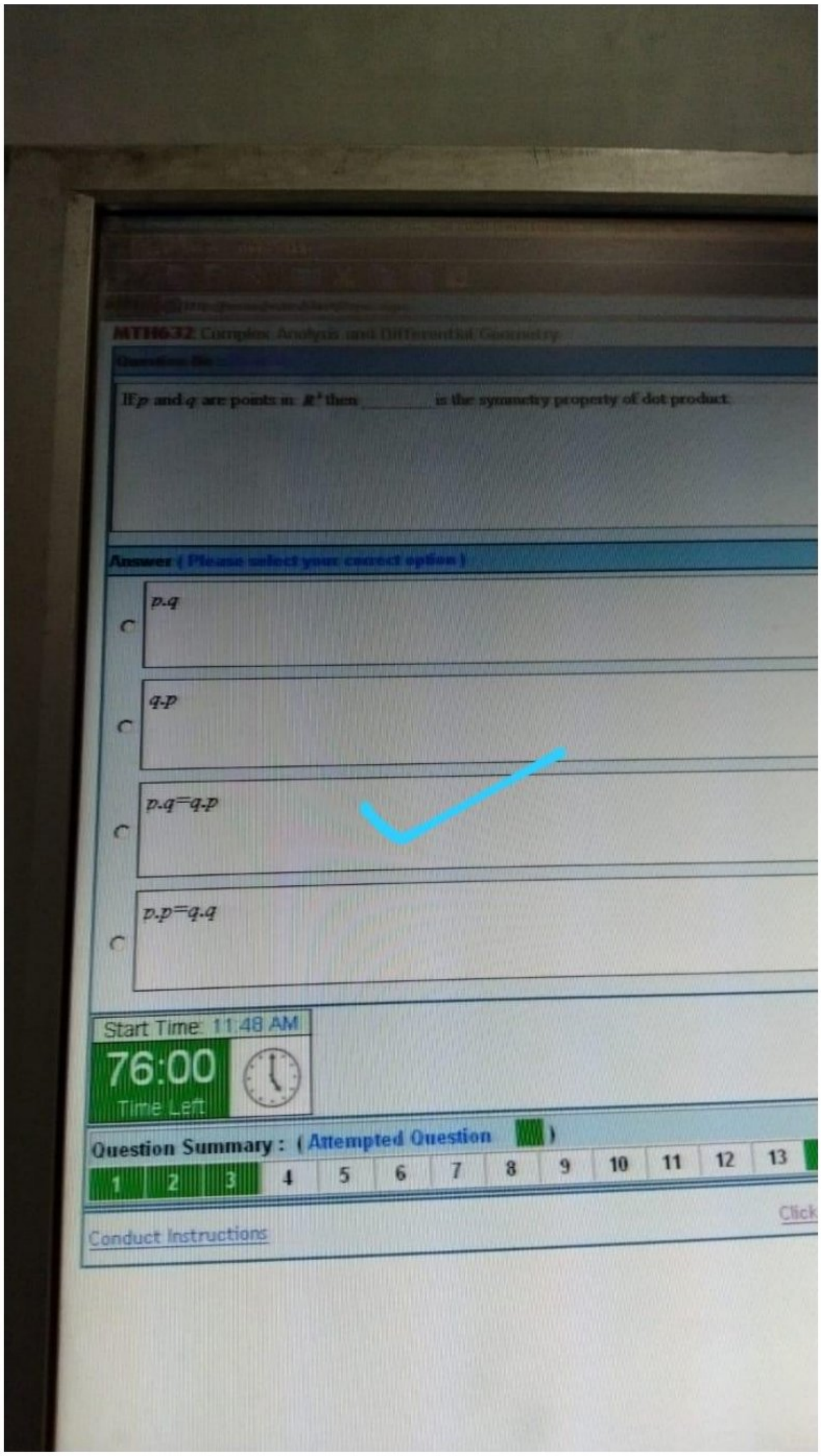
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MTH632 Complex Analysis and Differential Geometry

Question No :

A triplet $\vec{q} = (q_1, q_2, q_3)$ is called a _____ of Euclidean 3-space E^3.

Answer (Please select your correct option)

- line
- point

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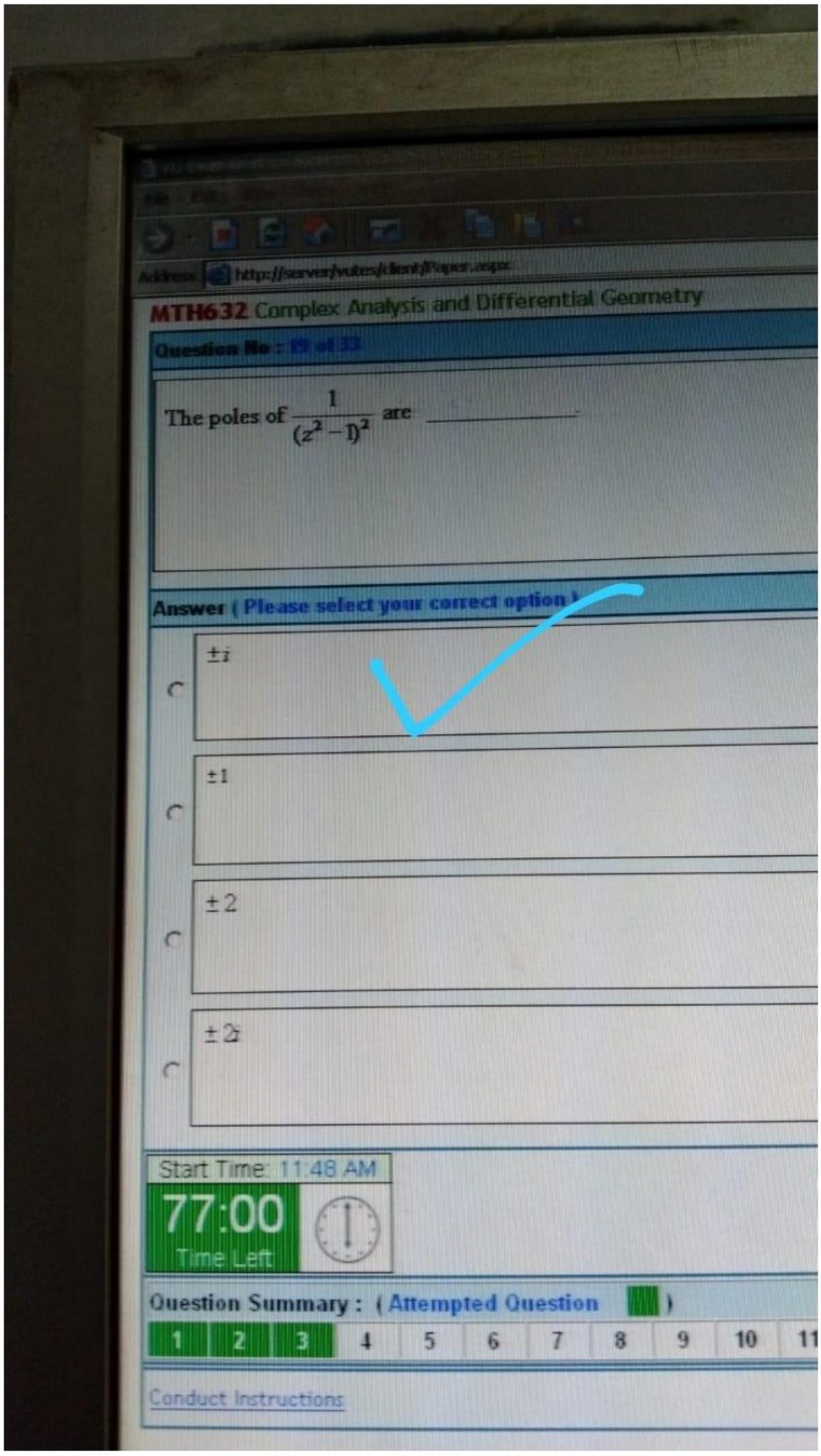
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MTH632 Complex Analysis and Differential Geometry MC1902

Question No : 14 of 33 **Marks:** 1 (Budgeted Time Min)

The definite integral of a complex valued function $w(t) = u(t) + i\,v(t)$ over an interval $a \le t \le b$ is _____, where u, v are real valued functions of a real variable t.

Answer (Please select your correct option)

- $\int_a^b w(t)dt = \int_a^b u(t)v(t)dt$
- $\int_a^b w(t)dt = \int_a^b u(t)dt + i\int_a^b v(t)dt$
- $\int_a^b w(t)dt = \int_a^b u(t)dt - i\int_a^b v(t)dt$
- $\int_a^b w(t)dt = \int_a^b u(t)v(t)dt$

14

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MTH632 Complex Analysis and Differential Geometry

If $\vec{x}(t)$ be a smooth space curve. Then which of the following is (are) known as the the Frenet formula (formulas)?

Answer (Please select your correct option)

(a) $\vec{t}' = k\vec{n}$

(b) $\vec{n}' = \tau\vec{b} - k\vec{t}$

(c) $\vec{b}' = -\tau\vec{n}$

(d) All (a), (b) and (c)

20

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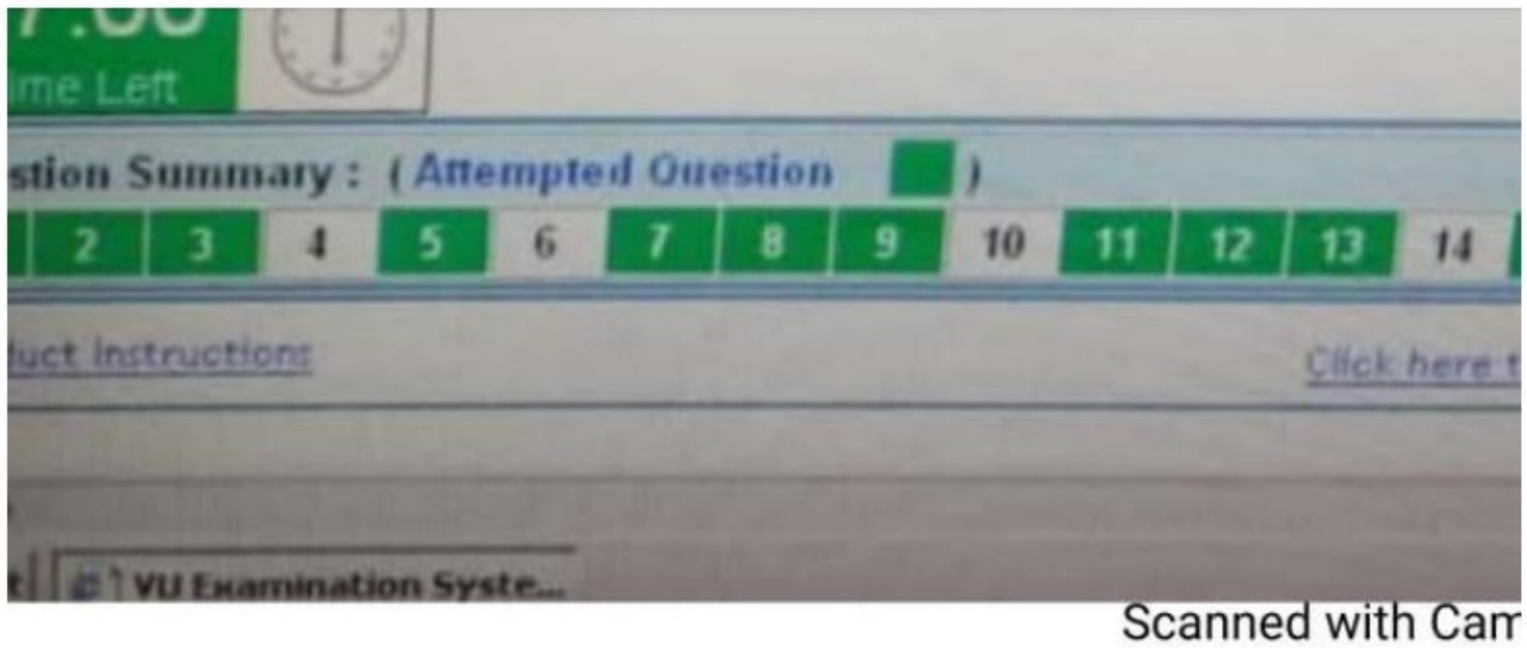
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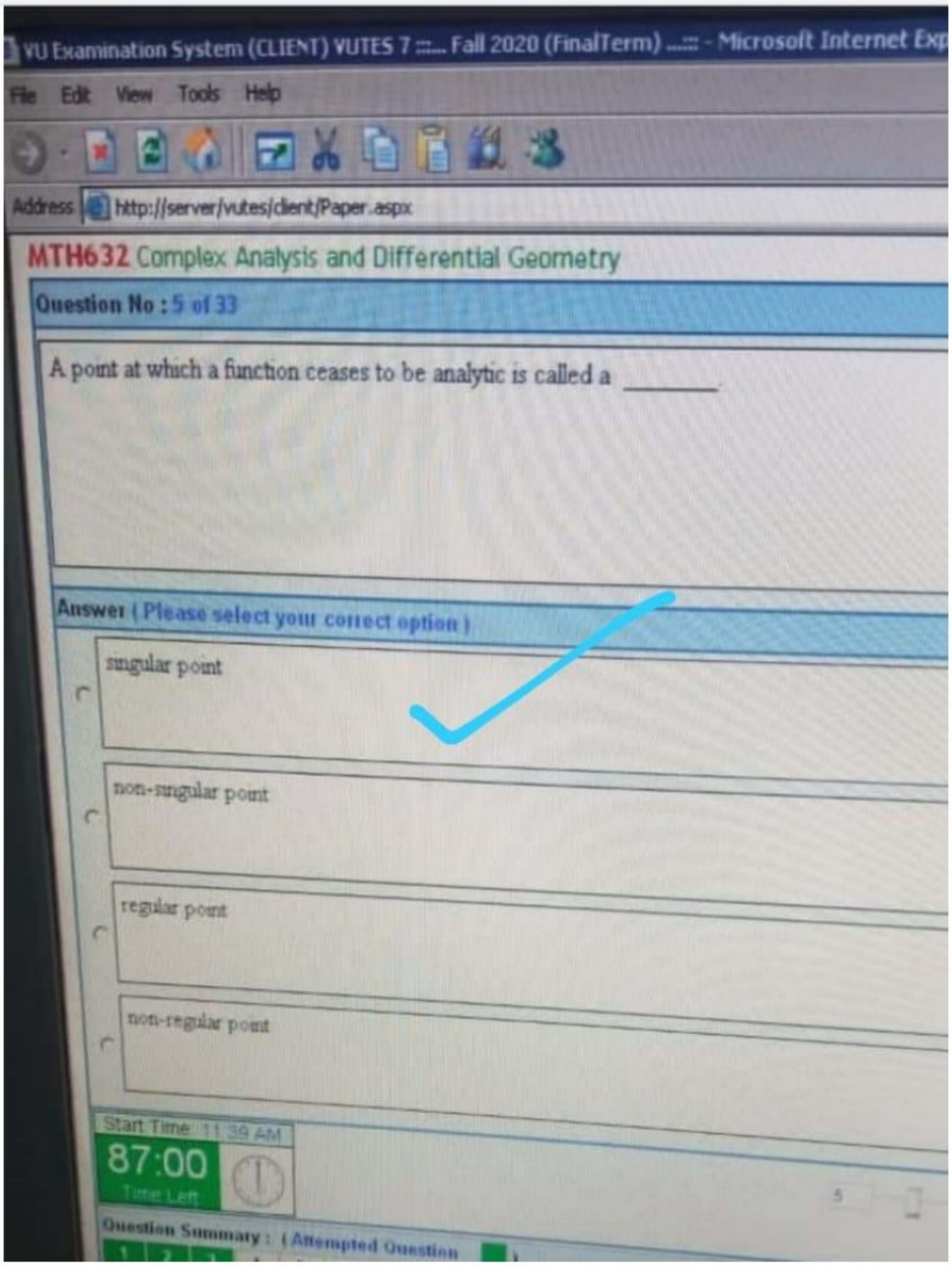
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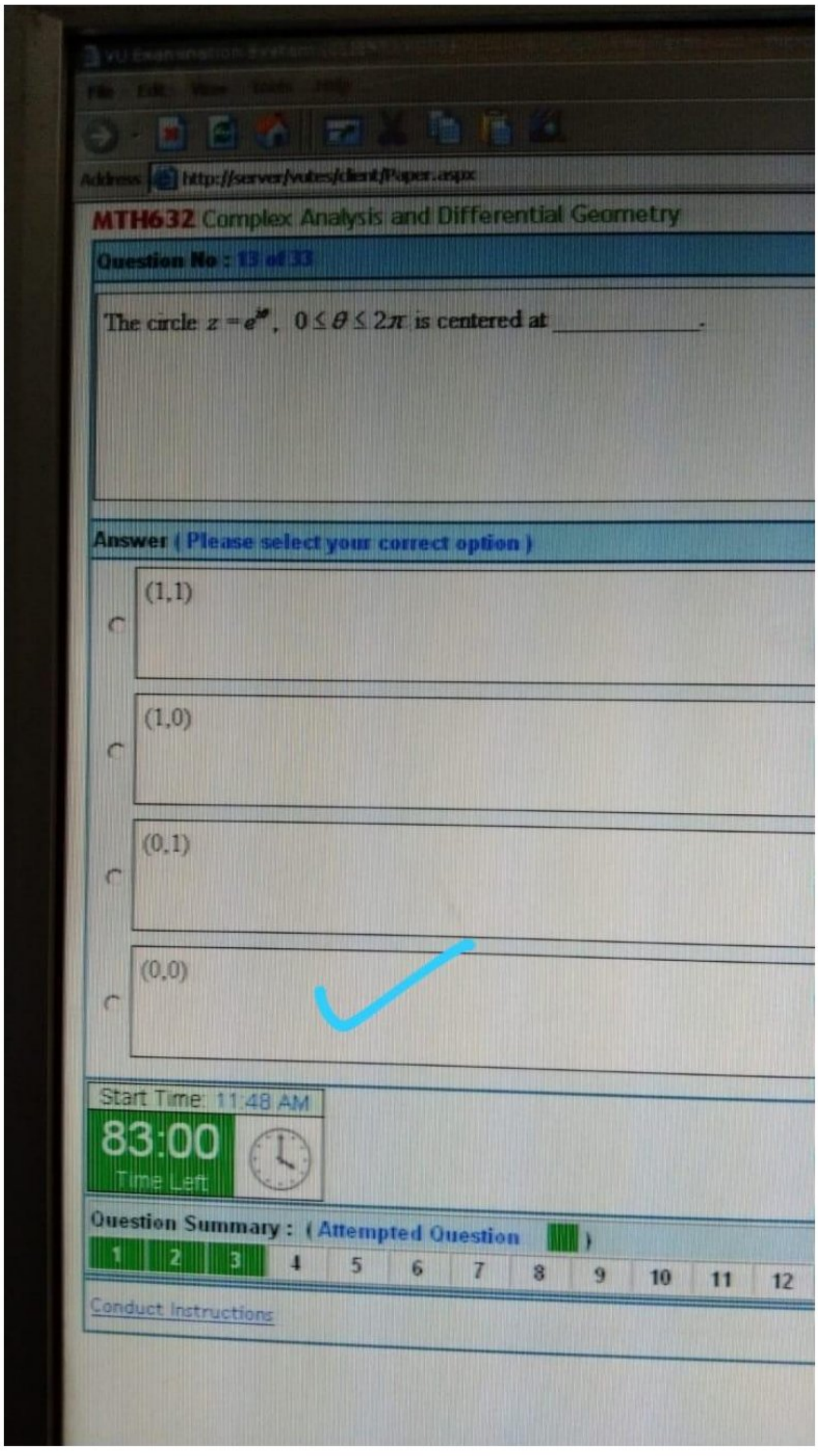
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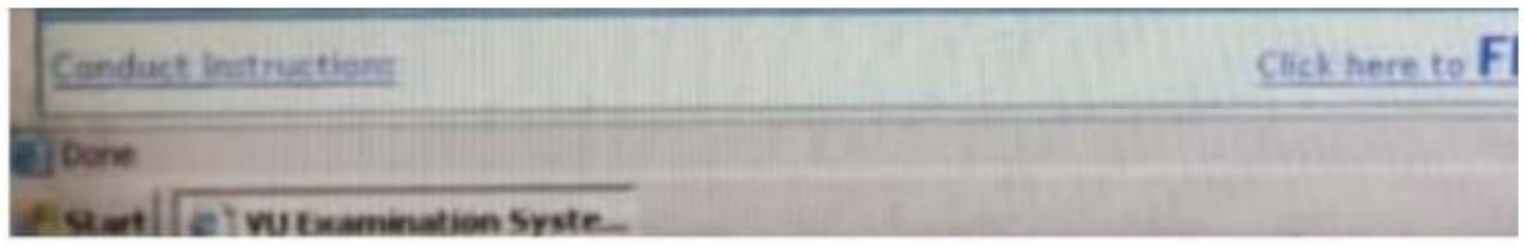
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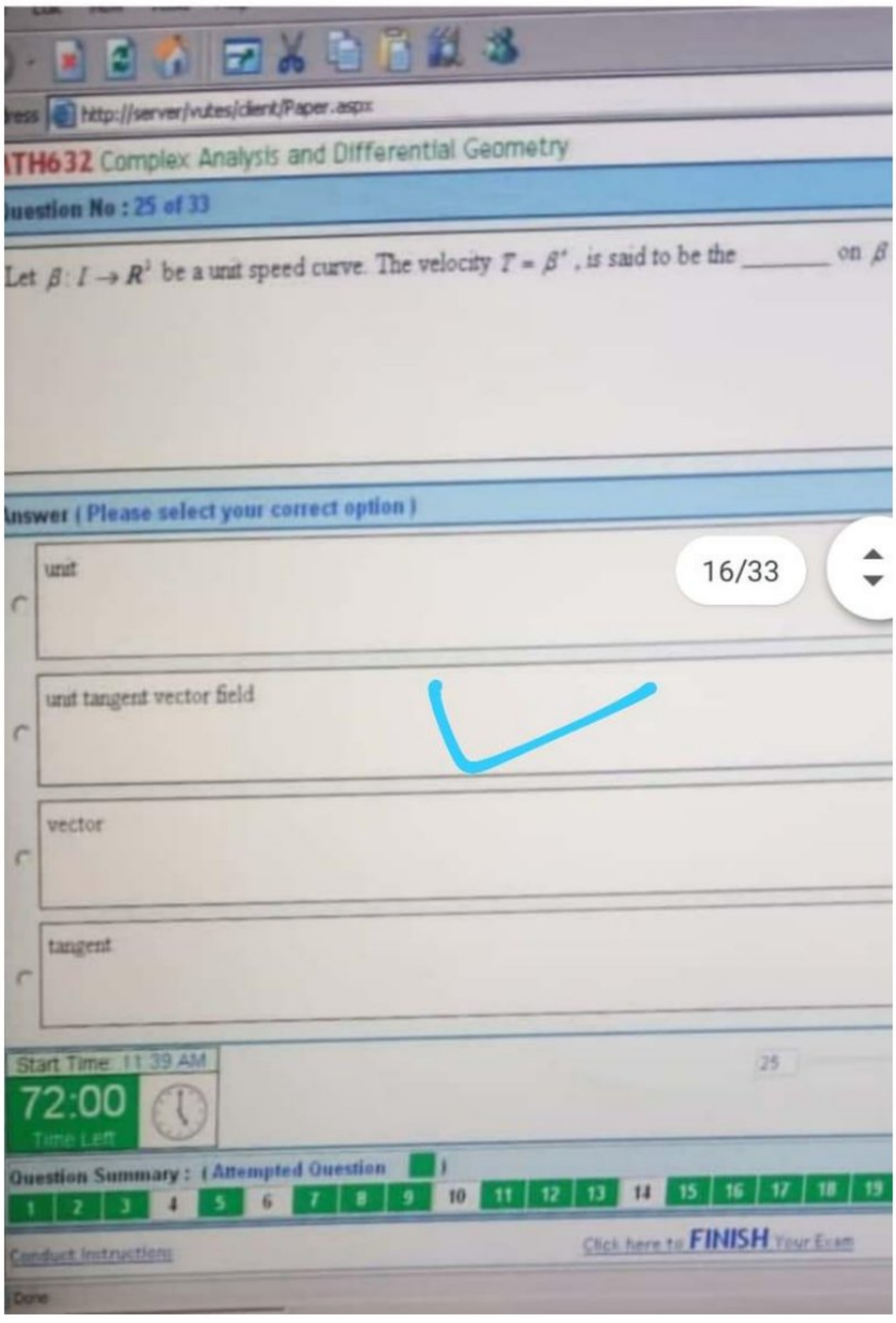


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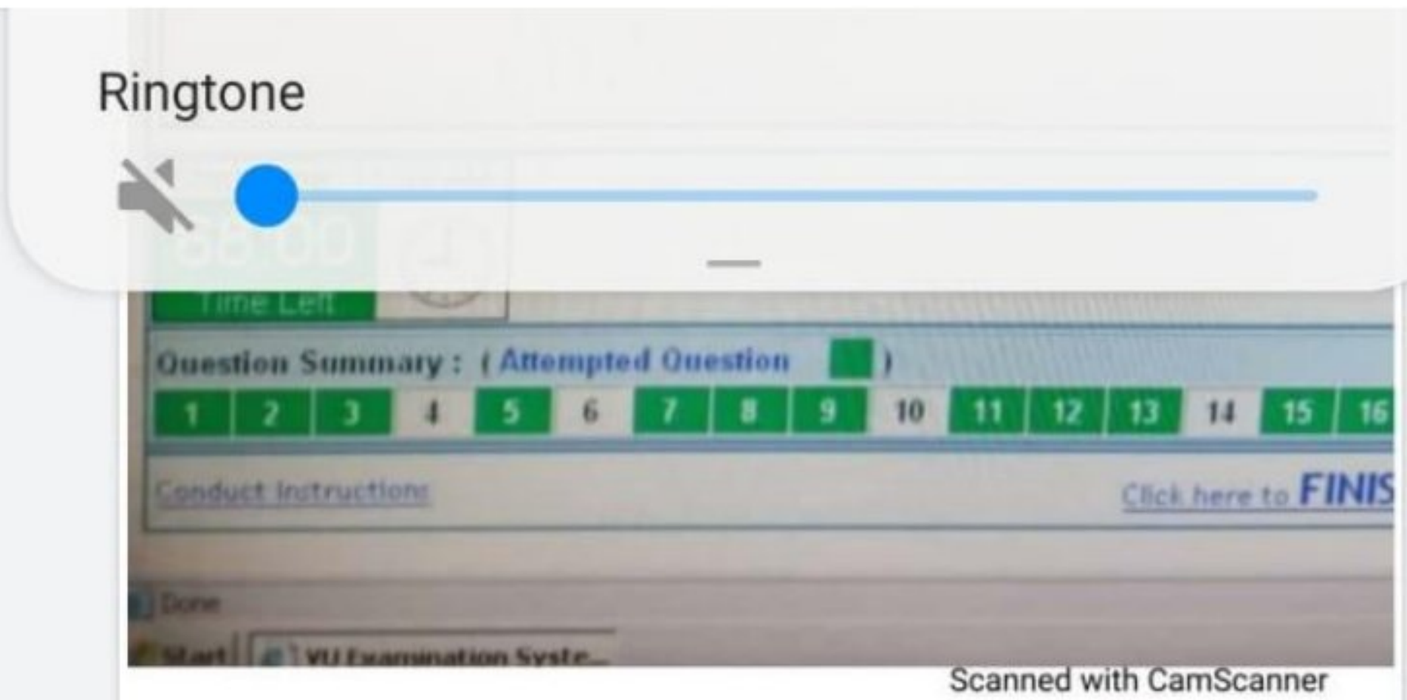


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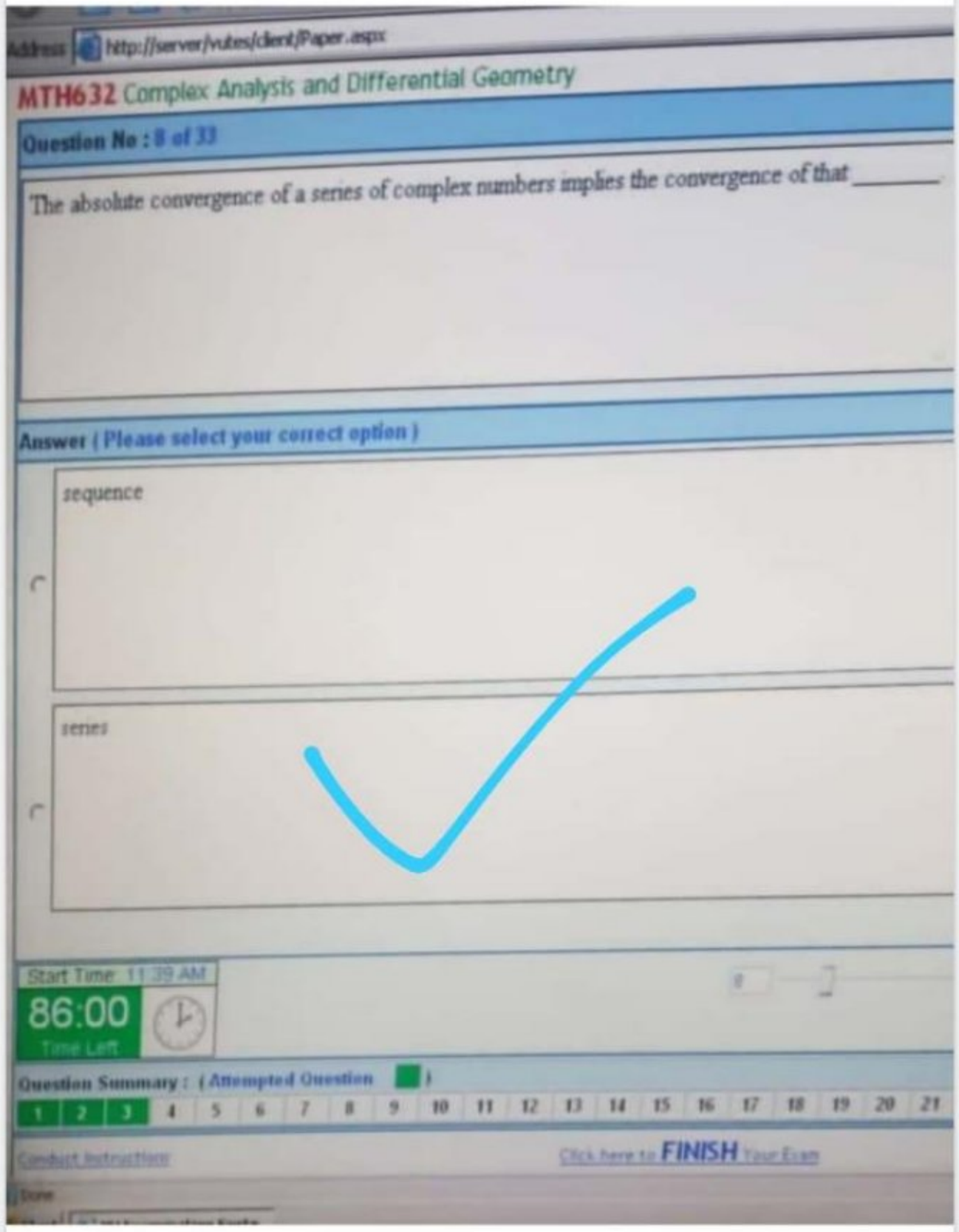




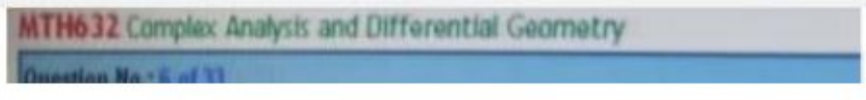
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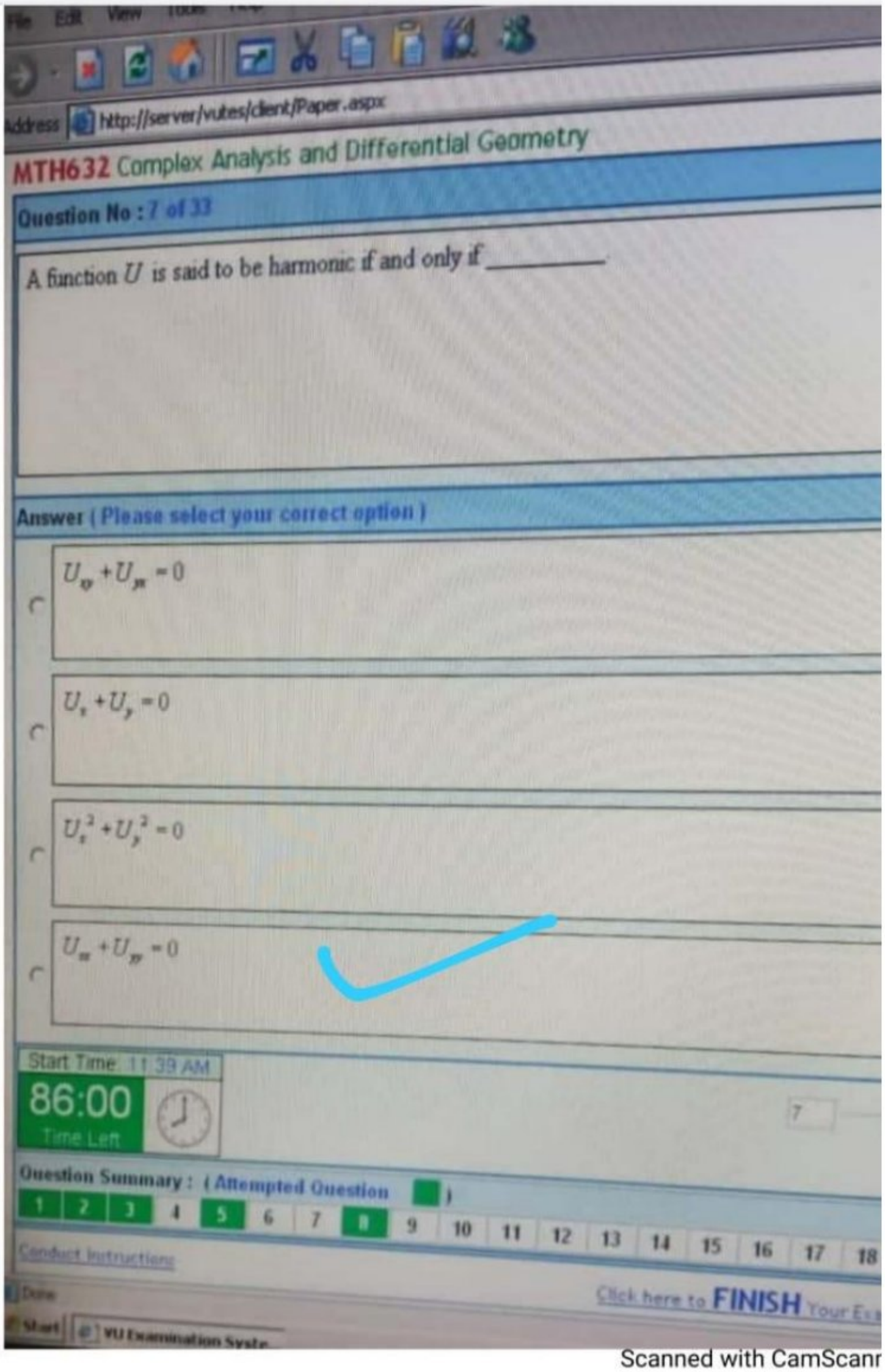


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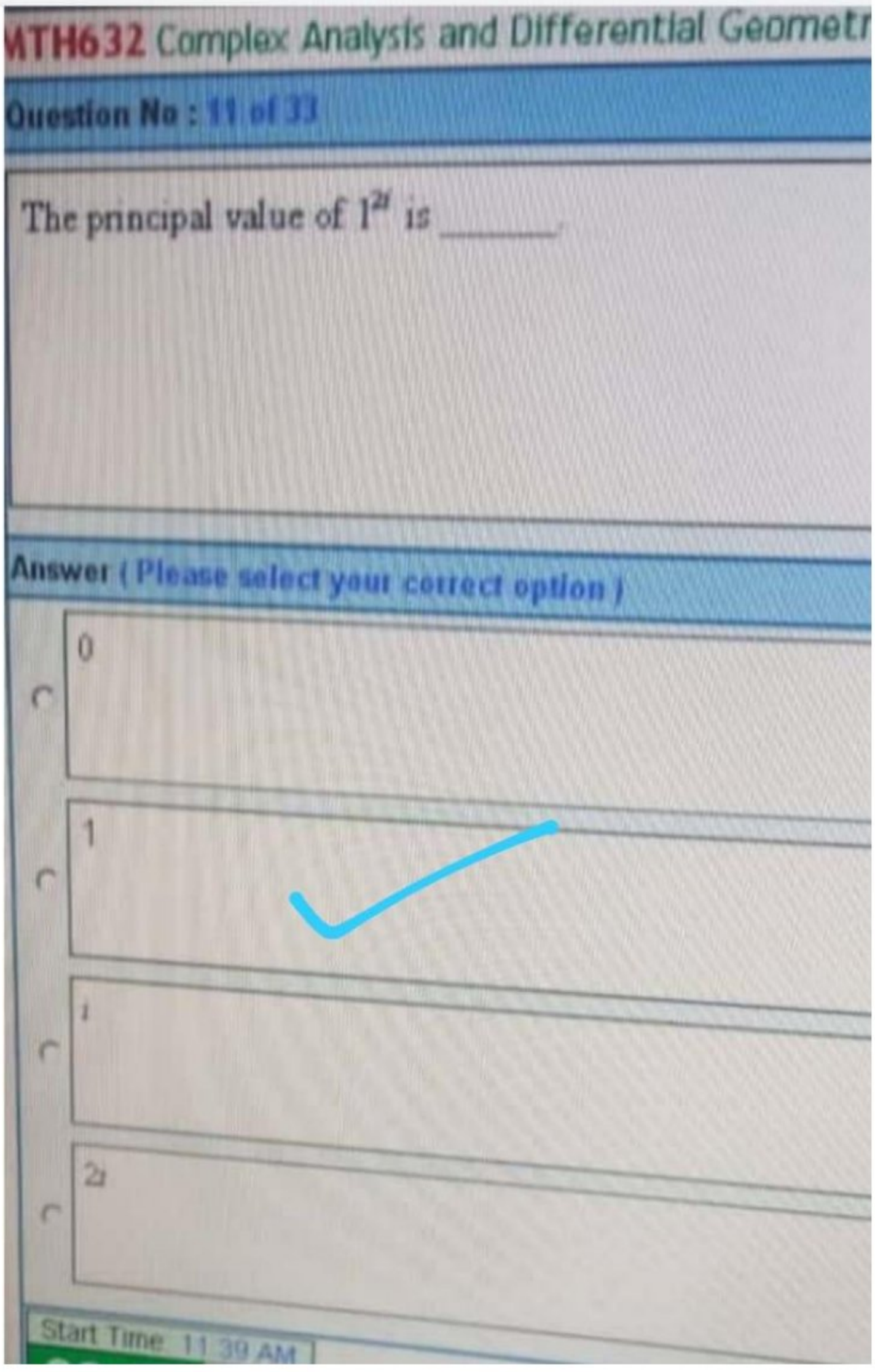


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Answer (Please select your correct option)

- $\int_a^b w(t)\,dt = \int_a^b u(t)\,v(t)\,dt$
- $\int_a^b w(t)\,dt = \int_a^b u(t)\,dt + \int_a^b v(t)\,dt$
- $\int_a^b w(t)\,dt = \int_a^b u(t)\,dt - \int_a^b v(t)\,dt$
- $\int_a^b w(t)\,dt = \int_a^b u(t)\,v(t)\,dt$

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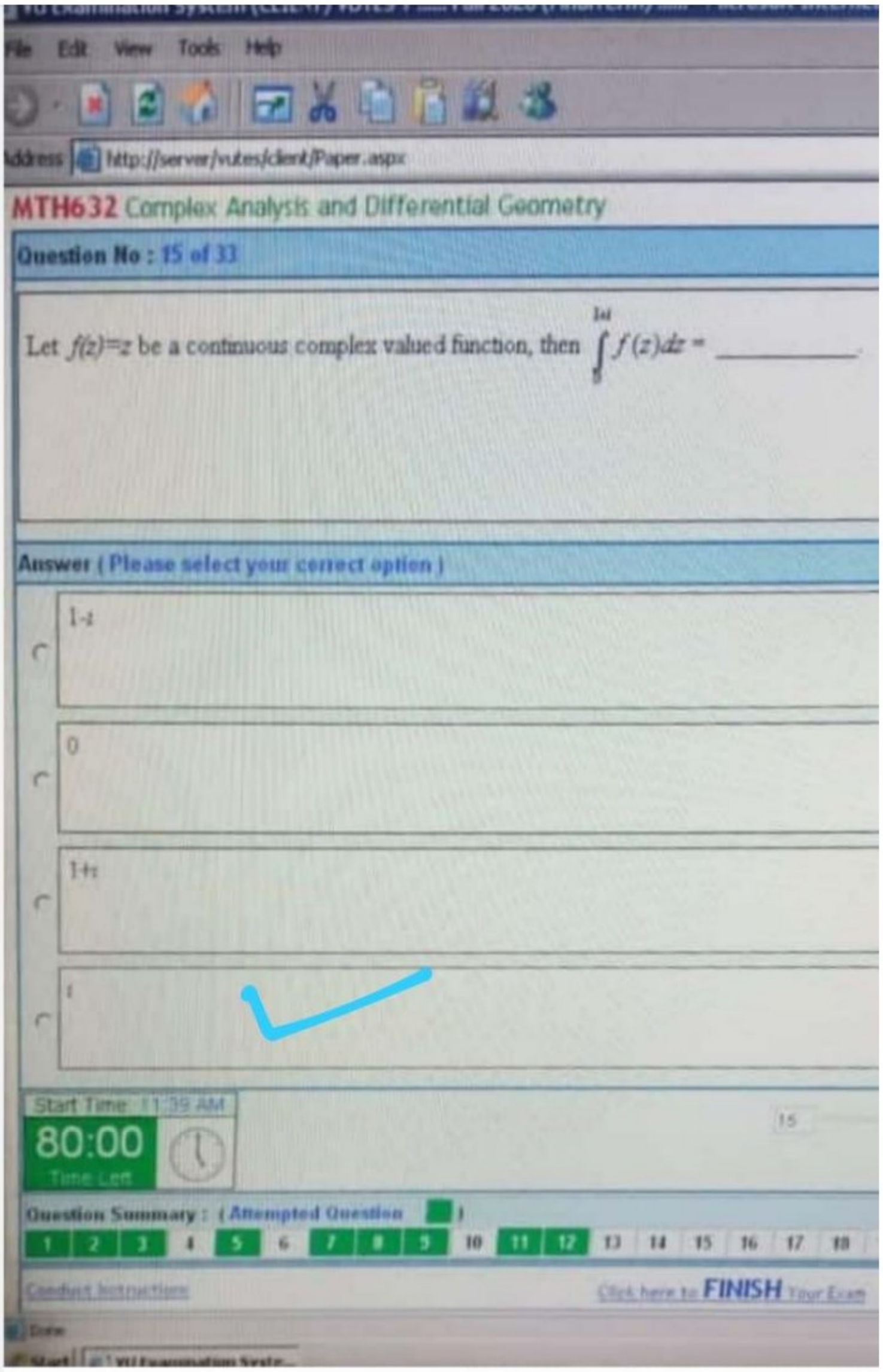
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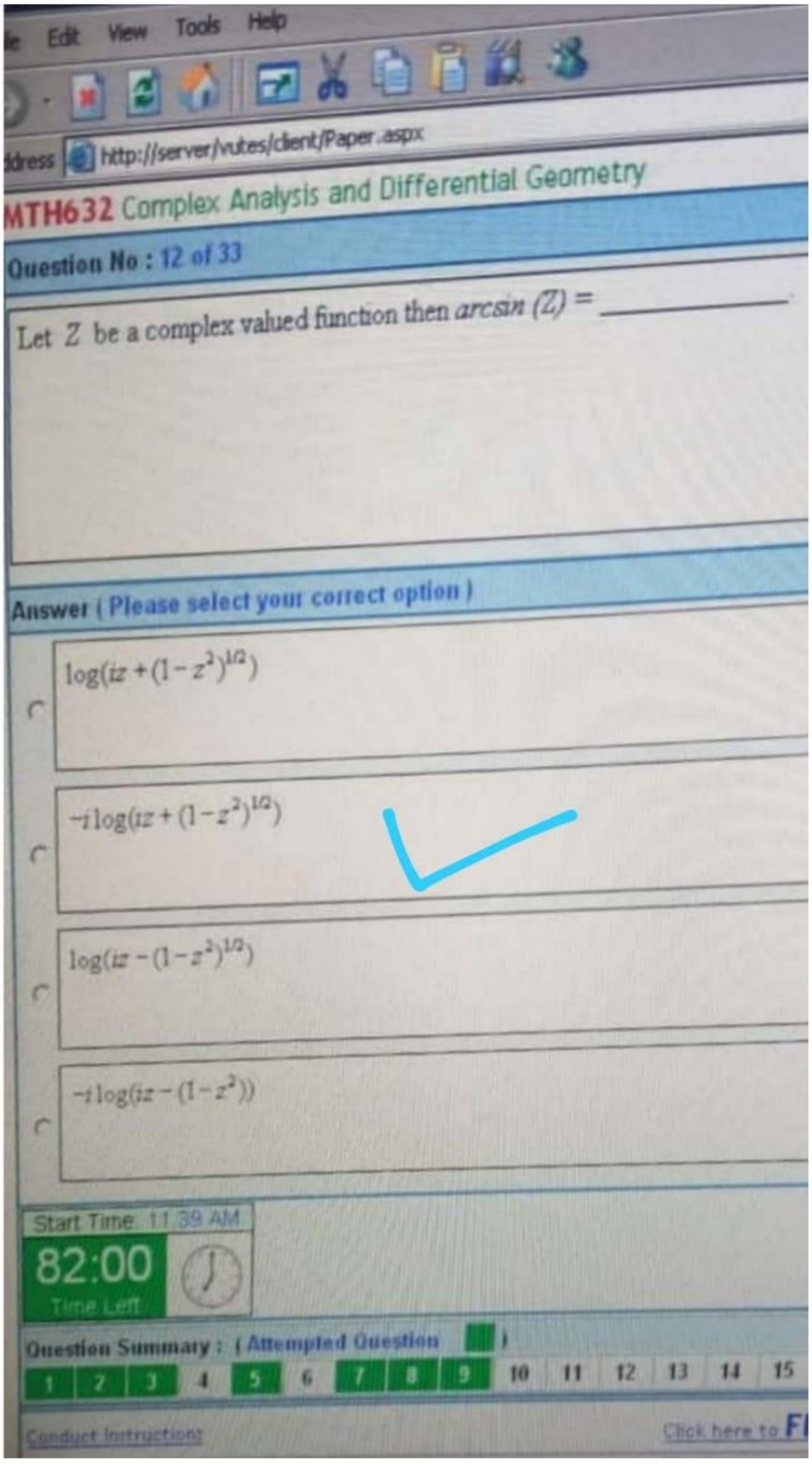
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MTH632 Complex Analysis and Differential Geometry

Question No : 39 of 41

Show that

(a) $Log(1+i)^2 = 2Log(1+i)$ and (b) $Log(-1+i)^2 \neq 2Log(-1+i)$

question 2 from file

Answer (Please click here to Add Answer)

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MTH632 Complex Analysis and Differential Geometry **MC1804**

Question No : 34 of 41 **Marks: 2 (Budgeted Time Min)**

If tangent vector along the helix $\vec{x}(t) = a(\cos t)\hat{e}_1 + a(\sin t)\hat{e}_2 + b(t)\hat{e}_3$, $a, b \neq 0$ is $\vec{x}'(t) = -a(\sin t)\hat{e}_1 + a(\cos t)\hat{e}_2 + b\hat{e}_3$.

Then evaluate the unit tangent vector $\vec{t}(s) = \dot{x} = \dfrac{\vec{x}'(t)}{|\vec{x}'(t)|}$.

Answer (Please click here to Add Answer)

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MTH632 Complex Analysis and Differential Geometry

Question No : 32 of 41

Test whether the function $w = 2xy + i(x^2 - y^2)$ is analytic or not.

Answer (Please click here to Add Answer)

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MTH632 Complex Analysis and Differential Geometry

Question No : 6 of 41

The limit of $f(z) = 2z^2 - 4z + 2$ at $z = i$ is _____

Answer (Please select your correct option)

- 5i
- - 4i ✓
- 2i
- -3i

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Question No : 8 of 41 Marks: 1 (Budgeted Time

If a function $f(z) = u(x,y) + iv(x,y)$ is analytic in a domain D, then its component functions u and v are _____.

Answer (Please select your corre tion)

- harmonic in D.
- equal in D.
- homogeneous in D.
- steady in D.

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MTH632 Complex Analysis and Differential Geometry

Question No : 11 of 41 **Marks: 1 (Budgeted Time Min)**

If $f(z) = x + ay + i(bx + cy)$ is analytic, then a, b, c equals to _____.

Answer (Please select your correct option)

- $c=1$ and $a=-b$
- $a=1$ and $c=-b$
- $b=1$ and $a=-c$
- $a=b=c=1$

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Question No : 14 of 41 **Marks: 1**

If $e^{ax}\cos y$ is harmonic then 'a' is _____.

Answer (Please select your correct option)

- 0
- -1
- 2
- i

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MTH632 Complex Analysis and Differential Geometry

Question No : 16 of 41

If $f(z) = z(2-z)$, then $f(1+i) =$ _____.

Answer (Please select your correct option)

- 0 — 2i is the anser
- 2
- i
- $-i$

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Question No : 21 of 41 Marks: 1 (Budgeted Time Min)

The derivative of a complex valued function $w(t) = u(t) + i\,v(t)$ is _____ , where u , v are real valued functions of a real variable t.

Answer (Please select your correct option)

- $w'(t) = u'(t) + iv'(t)$
- $w'(t) = u(t) + iv(t)$
- $w'(t) = u'(t)v'(t)$
- $w'(t) = u'(t) + v'(t)$

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Marks: 1 (Budgeted Time Min)

If the three vectors $\vec{t}$, $\vec{n}$ and $\vec{b}$ are perpendicular to each other and form the Frenet frame, then $\vec{b} \times \vec{t} =$ _____.

Answer (Please select your correct option)

- $\vec{b}$
- $\vec{t}$
- $\vec{n}$
- $-\vec{n}$

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Question No : 22 of 41 Marks: 1 (Budgeted Time

If $w(t)$ is a piecewise continuous complex-valued function defined on an interval $a \le t \le b$, then _____.

Answer (Please select your correct option)

- $\left|\int_a^b w(t)\,dt\right| \le \int_a^b |w(t)|\,dt$
- $\left|\int_a^b w(t)\,dt\right| \ge \int_a^b |w(t)|\,dt$
- $\left|\int_a^b w(t)\,dt\right| = \int_a^b |w(t)|\,dt$
- $\int_a^b w(t)\,dt \ge \left|\int_a^b |w(t)|\,dt\right|$

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MTH632 Complex Analysis and Differential Geome

Question No : 18 of 41

The principal value of i^i is _____.

Answer (Please select your correct option)

- $\exp(\frac{\pi}{2})$
- $\exp(-\frac{\pi}{2})$ ✓
- $\exp(i)$
- $\exp(-i)$

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MTH632 Complex Analysis and Differential Geometry

Question No : 30 of 41

Let $\beta : I \to R^1$ be a unit speed curve. The velocity $T = \beta'$, is said to be the _____

Answer (Please select your correct option)

- unit
- unit tangent vector field
- vector
- tangent

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MTH632 Complex Analysis and Differential Geometry

Question No : 19 of 41

Let Z be a complex valued function then $tanh\ Z =$ _____

Answer (Please select your correct option)

- $\frac{e^{-z}}{e^{z}+e^{-z}}$
- $\frac{e^{z}+e^{-z}}{e^{z}-e^{-z}}$
- $\frac{e^{z}-e^{-z}}{e^{z}+e^{-z}}$
- $\frac{e^{-z}}{e^{z}-e^{-z}}$

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MTH632 Complex Analysis and Differential Geometry

Question No : 28 of 41

Marks: 1 (Budgeted Time Min)

The differential of f is, $df = \frac{\partial f}{\partial x}dx + \frac{\partial f}{\partial y}dy + \frac{\partial f}{\partial z}dz$, where df calculates the small changes in the value of f when there is small change in _____.

Answer (Please select your correct option)

(a) x

(b) y

(c) z

(d) All (a), (b) and (c).

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Question No : 41 of 41 **Marks: 5 (Budgeted Time Min)**

Let C_1 denote the positively oriented boundary of the square whose sides lie along the lines $x = \pm 1, y = \pm 1$ and let C_2 be the positively oriented circle $|z| = 4$ (given in Fig. below). Explain why, $\int_{C_1} f(z)dz = \int_{C_2} f(z)dz$ where $f(z) = \dfrac{z+2}{\sin(z/2)}$?

y

Answer (Please click here to Add Answer)

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MTH632 Complex Analysis and Differential Geometry

Question No : 29 of 41

A differentiable function from R^n to R^m is known as a____

Answer (Please select your correct option)

- injective
- mapping
- surjective
- bijective

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MTH632 Complex Analysis and Differential Geometry

Question No : 26 of 41 **Marks: 1 (Budgeted Time Min)**

The scalar multiple of a vector $\vec{x} = (x_1, x_2, x_3)$ by a real number k is the point $k\vec{x} = (kx_1, kx_2, kx_3)$, clearly _____ for all k and $\vec{x}$.

Answer (Please select your correct option)

(a) $k\vec{x} = \vec{0}$

(b) $0\,\vec{x} = \vec{0}$

(c) $k\vec{0} = \vec{0}$

(d) both (b) and (c)

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MTH632 Complex Analysis and Differential Geometry

Question No : 25 of 41

If a function f is entire and bounded in the complex plane, then $f(z)$ is ____

Answer (Please select your correct option)

- imaginary
- real
- variable
- constant

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MTH632 Complex Analysis and Differential Geometry

Marks: 1 (Budgeted Time Min)

Question No : 24 of 41

Let C be the positively oriented circle $|z| = 2$. Since the function $f(z) = \dfrac{z}{9 - z^2}$ is analytic within and on C and since the point $z_0 = -i$ is interior to C, then using the Cauchy Integral formula $\int_C \dfrac{z}{(9 - z^2)(z+i)} dz =$ _____.

no idea

Answer (Please select your correct answer)

- $\frac{\pi}{9}$
- $\frac{\pi}{5}$
- 2π
- $2\pi i$

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MTH632 Complex Analysis and Differential Geometry

Question No : 20 of 41

The circle $z = e^{i\theta}$, $0 \le \theta \le 2\pi$ is centered at _____.

Answer (Please select your correct option)

- (1,1)
- (1,0)
- (0,1)
- (0,0)

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MTH632 Complex Analysis and Differential Geometry

Question No : 17 of 41

In the trigonometric functions of complex numbers $Sin\ x =$ ___

Answer (Please select your correct option)

- $\frac{e^{ix} - e^{-ix}}{2i}$
- $\frac{e^{ix} - e^{-ix}}{2}$
- $\frac{e^{-ix} - e^{ix}}{2i}$
- $\frac{e^{-ix} - e^{ix}}{2}$

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Question No : 15 of 41 Marks: 1 (Budgeted Time

A series converges to a number S if and only if the sequence of remainders tends to _____.

Answer (Please select your correct option)

- infinity
- one
- zero

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Question No : 13 of 41 Marks: 1 (Budg

If U and V are harmonic functions then $f(Z) = U + iV$ is _____.

Answer (Please select your correct option)

- analytic function.
- need not be analytic function.
- analytic function only at Z=0.
- none of the others.

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MTH032 Complex Analysis and Differential Geometry

Question No : 12 of 41 **Marks: 1 (Budgeted Tim**

If a series of complex numbers converges, the n^{th} term converges to zero as n tends to _____.

Answer (Please select your correct option)

- infinity
- finite numbers

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MTH632 Complex Analysis and Differential Geometry

Question No : 9 of 41 **Marks: 1 (Bu**

If Z_1 and Z_2 are two nonzero complex numbers then $Log(z_1 z_2)$ = _____.

Answer (Please select your correct option)

- $Log\, z_1\, Log\, z_2$
- $Log\, z_1 / Log\, z_2$
- $Log\, z_1 - Log\, z_2$
- $Log\, z_1 + Log\, z_2$

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MTH632 Complex Analysis and Differentia

Question No : 7 of 41

Let $f(z) = z^3 - 3z + 12$, then $f'(z)$ is _____

Answer (Please select your correct option)

- $z^2 - 3$
- $3z^2 - 3$
- $z^2 - 1$
- $z^3 - 3$

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MTH632 Complex Analysis and Differential Geometry

Question No : 3 of 41

The complex numbers $f(z) = 3iz/5$ then $\lim_{z \to 10} f(z) =$ ____

Answer (Please select your corre option)

- 6 i
- 2 i
- 3 i
- 10 i

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MTH632 Complex Analysis and Differential Geom

Question No : 7 of 41

Let $f(z) = z^3 - 3z + 12$, then $f'(z)$ is _____

Answer (Please select your correct option)

c $z^3 - 3$

c $3z^3 - 3$

c $z^3 - 1$

c $z^3 - 3$

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MTH632 Complex Analysis and Differential Geometry

Question No : 5 of 41

In the complex valued function $z = x - iy$, the value of $U_x =$ ___

Answer (Please select your correct option)

- -1
- 1
- 0
- 2

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MTH632 Complex Analysis and Differential Geometry

Question No : 1 of 41

The sum of two complex numbers, $z = 3 + i$, $w = -1 + 2i$ is, $z + w =$ ____

Answer (Please select your correct option)

- $2 + 3i$
- $3 + 2i$
- $-1 + i$
- $-3 + 2i$

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MTH632 Complex Analysis and Differential Geometry

Question No : 31 of 41

Find $f'(z)$, when $f(z)=(1-4z^2)^3$.

Answer (Please click here to Add Answer)

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MTH632 Complex Analysis and Differential Geometry

Question No : 36 of 41 Mar

If $\lim_{n\to\infty} z_n = z$ then by using the inequality, $||z_n|-|z|| \le |z_n - z|$, show that $\lim_{n\to\infty} |z_n| = |z|$.

Answer (Please click here to Add Answer)

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MTH632 Complex Analysis Differential Geometry

Question No : 32 of 41 **Marks**

Test whether the function $w = 2xy + i(x^2 - y^2)$ is analytic or not.

Answer (Please click here to Add Answer)

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MTH632 Complex Analysis and Differential Geometry

Question No : 33 of 41

Evaluate the integral: $\int_1^2 \left(\frac{1}{t} - i\right)^2 dt$.

Answer (Please click here to Add Answer)

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MTH632 Complex Analysis and Differential Geometry

Question No : 38 of 41

Let f and g be functions, ϕ and ψ be 1-forms. Then show that $d(fg) = df\,g + f\,dg$.

question #15 from file

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MTH632 Complex Analysis and Differential Geometry

Question No : 37 of 41

Show that $\frac{d}{dx}(\operatorname{arcsinh}(x)) = \frac{1}{\sqrt{1+x^2}}$.

topic #84 from book

Answer (Please click here to Add Answer)

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MTH632 Complex Analysis and Differential Geometry

Question No : 40 of 41

If $u = \log(x^2 + y^2)$ find v and $f(z)$ such that $f(z) = u + iv$ is analytic.

Answer (Please click here to Add Answer)

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Question No : 23 of 41 Marks: 1 (Budgeted Tin

Using the Cauchy–Goursat theorem when contour C is unit circle $\int_C \frac{z^2}{z-3}dz =$ _____

Answer (Please select your correct option)

- 3
- 0
- 1
- -3

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MTH632 Complex Analysis and Differential Geometry

Question No : 41 of 41 MC1

Marks: 5 (Budgeted Time Min)

Let C_1 denote the positively oriented boundary of the square whose sides lie along the lines $x = \pm 1, y = \pm 1$ and let C_2 be the positively oriented circle $|z| = 4$ (given in Fig. below). Explain why, $\int_C f(z)dz = \int_{C_1} f(z)dz$ where $f(z) = \dfrac{z+2}{\sin(z/2)}$?

y

Answer (Please click here to Add Answer)

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MTH632 Complex Analysis and Differential

Question No : 4 of 41

The reciprocal of the number, i is _____

Answer (Please select your correct option)

- -1
- 1
- i
- $-i$

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MTH632 Complex Analysis and Differential Geometry

Question No : 35 of 41

Evaluate $\lim_{z \to i} \frac{(z^2 + 4z + 2)}{z + 1}$.

Answer (Please click here to Add Answer)

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MTH632 Complex Analysis and Differential Geometry

Question No : 10 of 41 **Marks: 1 (Budgeted Time Min)**

The sequence $z_n = \frac{i}{n^2}$ $(n = 1,2,3,...)$ for $n \to \infty$ converges to _____.

Answer (Please select your correct option)

- 1
- 0
- infinity
- 1/2

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Question No : 23 of 41 Marks: 1 (Budgeted Time Min)

Using the Cauchy–Goursat theorem when contour C is unit circle $\int_C \frac{z^2}{z-3} dz =$ _____

Answer (Please select your correct option)

- 3
- 0
- 1
- -3

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Question No : 24 of 41 Marks: 1 (Budgeted Time

By using the Extension of Cauchy Integral formula $\int_c \frac{f(z)}{(z-z_0)^{n+1}} dz =$ _____

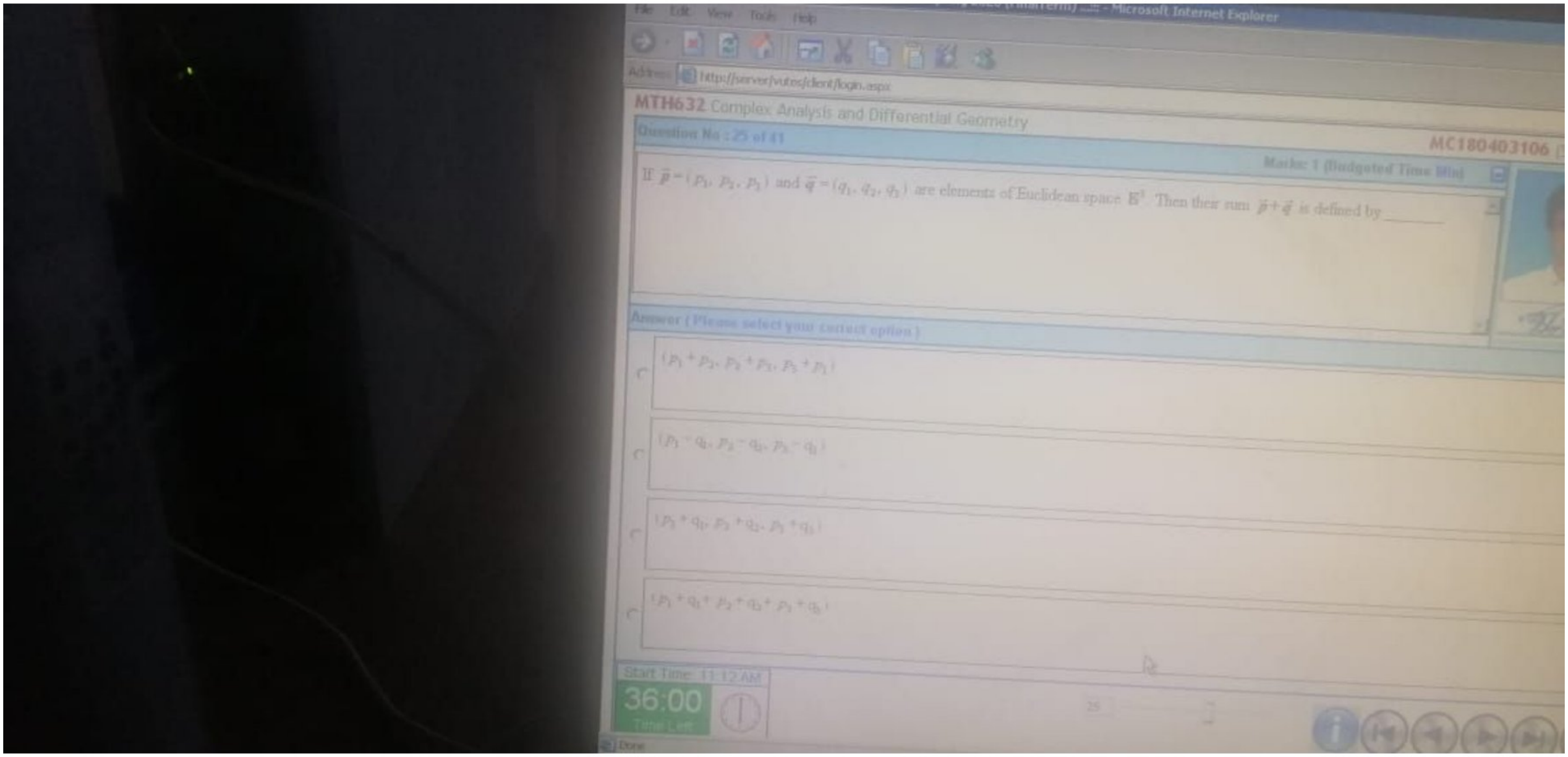
Answer (Please select your correct option)

- $f^{(n)}(z_0)$
- $2\pi i\, f^{(n)}(z_0)$
- $\frac{f^{(n)}(z_0)}{n!}$
- $\frac{2\pi i}{n!} f^{(n)}(z_0)$

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Question No : 30 of 41 **Marks: 1 (Budgeted Time Min)**

The restriction of a curve $\alpha : I \to R^3$ to a close interval $[a, b]$ is known as a _____.

Answer (Please select your correct option)

- curve
- segment
- line
- curve segment

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Question No : 29 of 41 **Marks: 1 (Budgeted Time Min)**

If p and q are points in R^3 then _____ is the symmetry property of dot product.

Answer (Please select your correct option)

- $p.q$
- $q.p$
- $p.q=q.p$
- $p.p=q.q$

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MTH632 Complex Analysis and Differential Geometry

Question No : 18 of 41 Marks: 1 (Budgeted Time

The principal value of i^i is _____.

Answer (Please select your correct option)

- $\exp(\frac{\pi}{2})$
- $\exp(-\frac{\pi}{2})$
- $\exp(i)$
- $\exp(-i)$

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Question No : 26 of 41 **Marks: 1 (Budgeted Time Min)**

Let $f(z)$ be analytic function and C is contour enclosing point z_0, then Cauchy Integral formula states $f(z_0)$= _____.

Answer (Please select your correct option)

- $\frac{1}{2\pi i}\int_C \frac{f(z)}{z-z_0}dz$
- $\int_C \frac{f(z)}{z-z_0}dz$
- $\frac{1}{2\pi i}\int_C \frac{f(z)}{z+z_0}dz$
- $\int_C \frac{f(z)}{z+z_0}dz$

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Question No : 28 of 41 **Marks: 1 (Budgeted Time Min)**

The differential of f is, $df = \frac{\partial f}{\partial x}dx + \frac{\partial f}{\partial y}dy + \frac{\partial f}{\partial z}dz$, where df calculates the small changes in the value of f when there is small change in _____

Answer (Please select your correct option)

- (a) x
- (b) y
- (c) z
- (d) All (a), (b) and (c).

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Marks: 1 (Budgeted Time

Question No : 23 of 41

Using the Cauchy–Goursat theorem when contour C is unit circle $\int_C \frac{z^2}{z-3}dz =$ _____

Answer (Please select your correct option)

- 3
- 0
- 1
- -3

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Marks: 1 (Budgeted Time Min)

Question No : 21 of 41

The answer of definite integral of a complex valued function $w(t) = \int_1^2 i dt$ is _____

Answer (Please select your correct option)

1

2

i

0

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Question No : 22 of 41 Marks: 1 (Budgeted Time Min)

Let $f(z)=z$ be a continuous complex valued function, then $\int_0^{1+i} f(z)dz =$ _____

Answer (Please select your correct option)

- 1-i
- 0
- 1+i
- i

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Marks: 1 (Budgeted

Question No : 20 of 41

The circle $z = e^{i\theta}$, $0 \le \theta \le 2\pi$ is oriented in _____ direction.

Answer (Please select your correct option)

- upward
- downward
- counter-clockwise
- clockwise

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Marks: 1 (Budgeted Time Min)

Question No : 17 of 41

For hyperbolic functions of complex numbers $Cosh\ x$ = _____.

Answer (Please select your correct

- $\frac{e^x + e^{-x}}{2i}$
- $\frac{e^x - e^{-x}}{2i}$
- $\frac{e^{-x} - e^x}{2}$
- $\frac{e^x + e^{-x}}{2}$

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Question Summary : (Attempted Question)

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Question No : 19 of 41 **Marks: 1 (Budgeted Time Min)**

Let Z be a complex valued function then $tanh\ Z =$ _____.

Answer (Please select your correct option)

- $\frac{e^{-z}}{e^{z}+e^{-z}}$
- $\frac{e^{z}+e^{-z}}{e^{z}-e^{-z}}$
- $\frac{e^{z}-e^{-z}}{e^{z}+e^{-z}}$ ✓
- $\frac{e^{-z}}{e^{z}-e^{-z}}$

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Question No : 16 of 41 **Marks: 1 (Budgeted Time Min)**

The points at which $f(z) = \frac{1}{z^2+1}$ is not analytic are _____

Answer (Please select your correct option)

- 1 and -1
- i and $-i$
- 1 and i
- -1 and $-i$

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Question No : 15 of 41 **Marks: 1 (Budge**

The absolute convergence of a series of complex numbers implies the convergence of that _____.

Answer (Please select your correct option)

- sequence
- series

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Question No : 14 of 41 **Marks: 1 (Budgeted Time Min**

Harmonic conjugate of $u(x, y) = e^y \cos x$ is _____.

Answer (Please select your correct option)

- $e^x \cos y + c$
- $e^x \sin y + c$
- $e^y \sin x + c$
- $-e^y \sin x + c$

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Question No : 13 of 41 Marks: 1 (Budgeted Time Min)

If U and V are harmonic functions then $f(Z) = U + iV$ is _____.

Answer (Please select your correct option)

- analytic function.
- need not be analytic function.
- analytic function only at Z=0.
- none of the others.

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Marks: 1 (Budgeted Time Min)

Question No : 12 of 41

If a series of complex numbers converges, the n^{th} term converges to zero as n tends to _____.

Answer (Please select your correct option)

infinity

finite numbers

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Question No : 11 of 41 **Marks: 1 (Budgeted Time Min)**

A point at which a function ceases to be analytic is called a _____.

Answer (Please select your correct option)

- singular point
- non-singular point
- regular point
- non-regular point

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Question No : 10 of 41 Marks: 1 (Budgeted Time Min)

Any polynomial $p(z) = a_0 + a_1 z + a_2 z^2 + \ldots + a_n z^n$ $(a_n \neq 0)$ of degree n $(n \geq 1)$ has at least one zero. That is, there exists at least _____ z_0, such that $P(z_0) = 0$.

Answer (Please select your correct option)

- one point
- n points
- no points
- 10 points

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Marks: 1 (Budgeted Time Min)

Question No : 8 of 41

If a function $f(z) = u(x,y) + iv(x,y)$ is analytic in a domain D, then its component functions u and v are _____.

Answer (Please select your correct option)

- harmonic in D.
- equal in D.
- homogeneous in D.
- steady in D.

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Question No : 9 of 41 **Marks: 1 (Budgeted Time Mi**

The logarithmic function of $e^w = z$, where $z = re^{i\theta}$ and $w = u + iv$, then _____.

Answer (Please select your correct option)

- $w = \ln r + i(\theta + 2n\pi)$
- $w = re^{i\theta}$
- $w = r + i(\theta + 2n\pi)$
- $w = -\ln r + i\,\theta$

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MTH632 Complex Analysis and Differential Geometry

Question No : 6 of 41 **Marks: 1 (Budgeted Time Min)**

In the complex valued function $f(z) = \frac{1}{re^{i\theta}}$, the value of $U_\theta =$ _____.

daout

Answer (Please select your correct option)

- $e^{r\theta}$
- $\sin\theta$
- $\frac{\sin\theta}{r}$ ✓
- $-\frac{\sin\theta}{r}$

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Marks: 1 (Budgeted Time Min)

Question No : 7 of 41

Let $f(z) = 2z^3 + 2z - 7$, then $f'(z)$ is _____

Answer (Please select your correct o

- $6z^2 + 2$
- $z^2 + 2$
- $2z^2 - 7$
- $2z^3 + 2$

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MC1804

MTH632 Complex Analysis and Differential Geometry

Marks: 1 (Budgeted Time Min)

Question No : 4 of 41

The absolute value of the number, $z = 1-i$ is _____.

Answer (Please select your correct option)

- 2
- $\sqrt{2}$
- 0
- 1

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MTH632 Complex Analysis and Differential Geometry **MC180403106** (SAD

Question No : 5 of 41 **Marks: 1 (Budgeted Time Min)**

The magnitude of exp(-2+3i) is _____.



Answer (Please select your correct option)

- exp(-2*3)
- exp(2*3)
- exp(3)
- exp(-2)

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MC180403106

MTH632 Complex Analysis and Differential Geometry

Question No : 3 of 41 Marks: 1 (Budgeted Time Min)

The conjugate of complex number $z = -3 - 3i$ is _____.

Answer (Please select your correct o

- $3 + 3i$
- $-3 + 6i$
- $3 - 3i$
- $-3 + 3i$

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MTH632 Complex Analysis and Differential Geometry **MC18**

Question No : 2 of 41 **Marks: 1 (Budgeted Time Min)**

The modulus of $z = 3+2i$ is _____.

Answer (Please select your correct option)

- $\sqrt{5}$
- $\sqrt{6}$
- $\sqrt{12}$
- $\sqrt{13}$ ✓

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MTH632 Complex Analysis and Differential Geometry

Question No : 1 of 41 **Marks: 1 (Budgeted Time**

The sum of two complex numbers, $z = 3 + i$, $w = -1 + 2i$ is, $z + w =$ _____.

Answer (Please select your correct o

- $2 + 3i$
- $3 + 2i$
- $-1 + i$
- $-3 + 2i$

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MTH632 Complex Analysis and Differential Geometry **MC180**

Question No : 41 of 41 **Marks: 5 (Budgeted Time Min)**

Let C denote the positively oriented boundary of the square whose sides lie along the lines $x = \pm 2$ and $y = \pm 2$. Evaluate the integral $\int_C \frac{\tan(z/2)}{(z - x_0)^2} dz$, $(-2 < x_0 < 2)$ by using the extended Cauchy integral formula.

Answer (Please click here to Add Answer)

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MTH632 Complex Analysis and Differential Geometry

Question No : 40 of 41

Marks: 5 (Budgeted Time

Verify that $\sum_{n=0}^{\infty} z^n = \frac{1}{1-z}$ whenever $|z|<1$.

Answer (Please click here to Add Answer)

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MTH632 Complex Analysis and Differential Geometry

Question No : 39 of 41 **Marks: 5 (Bu**

Find a function w such that $w = u + iv$ is analytic, if $u = e^x \sin y$.

Answer (Please click here to Add Answer)

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MTH632 Complex Analysis and Differential Geometry MC180

Question No : 38 of 41 **Marks: 3 (Budgeted Time Min)**

Verify the Frenet formula for the relation, $\vec{n}' = \tau\vec{b} - k\vec{t}$, where $k > 0$ and τ are curvature and torsion of a curve respectively.

Answer (Please click here to Add Answer)

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MTH632 Complex Analysis and Differential Geometry

Question No : 37 of 41 **Marks: 3 (Bu**

Evaluate the integral: $\int_0^{\pi/6} e^{i2t}\,dt$.

Answer (Please click here to Add Answer)

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MTH632 Complex Analysis and Differential Geometry

Question No : 36 of 41 **Marks: 3 (Budgeted Tim**

Prove that $u = e^{-y} \sin x$ is harmonic.

Answer (Please click here to Add Answer)

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MTH632 Complex Analysis and Differential Geometry

Question No : 35 of 41 **Marks: 3 (Budgeted Time M**

Evaluate, $\lim_{z \to i} \frac{z^4 - 1}{z^2 + 1}$.

Answer (Please click here to Add Answer)

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MTH632 Complex Analysis and Differential Geometry

Question No : 32 of 41 **Marks: 2 (Budgeted**

Test whether the function $w = 2xy + i(x^2 - y^2)$ is analytic or not.

Answer (Please click here to Add Answer)

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MTH632 Complex Analysis and Differential Geometry **MC1804**

Question No : 34 of 41 **Marks: 2 (Budgeted Time Min)**

If tangent vector along the helix $\vec{x}(t) = a(\cos t)\hat{e}_1 + a(\sin t)\hat{e}_2 + b(t)\hat{e}_3$, $a, b \neq 0$ is $\vec{x}'(t) = -a(\sin t)\hat{e}_1 + a(\cos t)\hat{e}_2 + b\hat{e}_3$.

Then evaluate the unit tangent vector $\vec{t}(s) = \dot{x} = \dfrac{\vec{x}'(t)}{|\vec{x}'(t)|}$.

Answer (Please click here to Add Answer)

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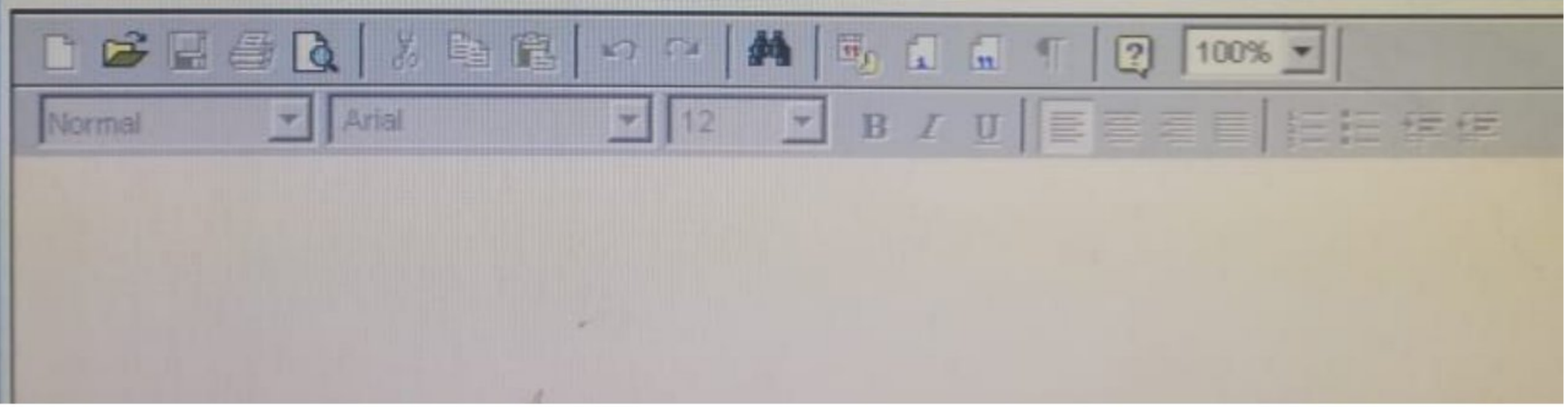
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MTH632 Complex Analysis and Differential Geometry

Question No : 33 of 41

Show that $\frac{d}{dz}(\sin(z)) = \frac{1}{\sqrt{1-z^2}}$.

Answer (Please click here to Add Answer)



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MTH632 Complex Analysis and Differential Geometry

Question No : 31 of 41 MC18

Marks: 2 (Budgeted Time Min)

Evaluate $\lim_{z \to i} f(z)$, where $f(z) = 3z^2 - iz + 4 - 5i$ is a polynomial, it is continuous at all points in the complex plane.

Answer (Please click here to Add Answer)

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MTH632 Complex Analysis and Differential Geometry

Question No : 26 of 41

Marks: 1 (Budgeted Time Min)

The scalar multiple of a vector $\vec{x} = (x_1, x_2, x_3)$ by a real number k is the point $k\vec{x} = (kx_1, kx_2, kx_3)$, clearly _____ for all k and $\vec{x}$.

Answer (Please select your correct option)

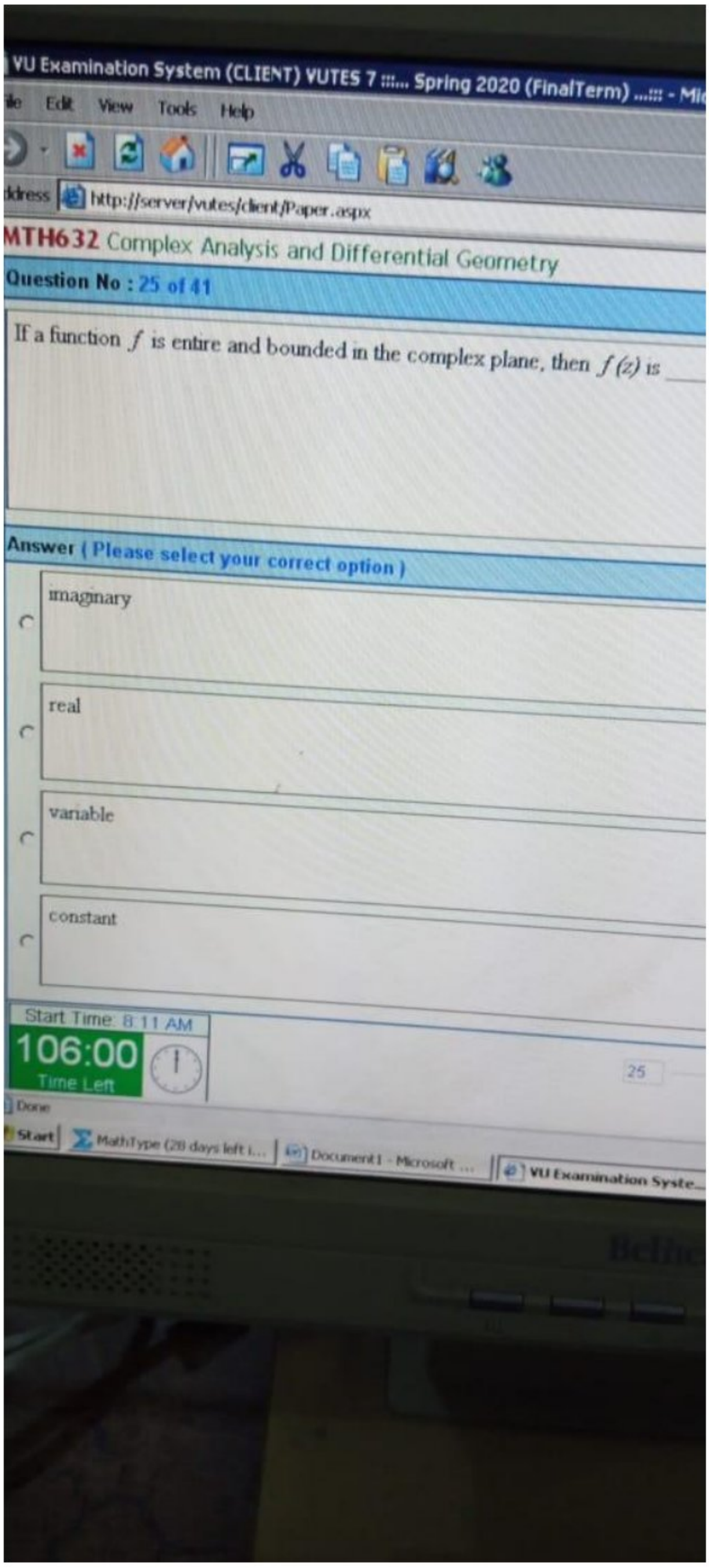
(a) $k\vec{x} = \vec{0}$

(b) $0\vec{x} = \vec{0}$

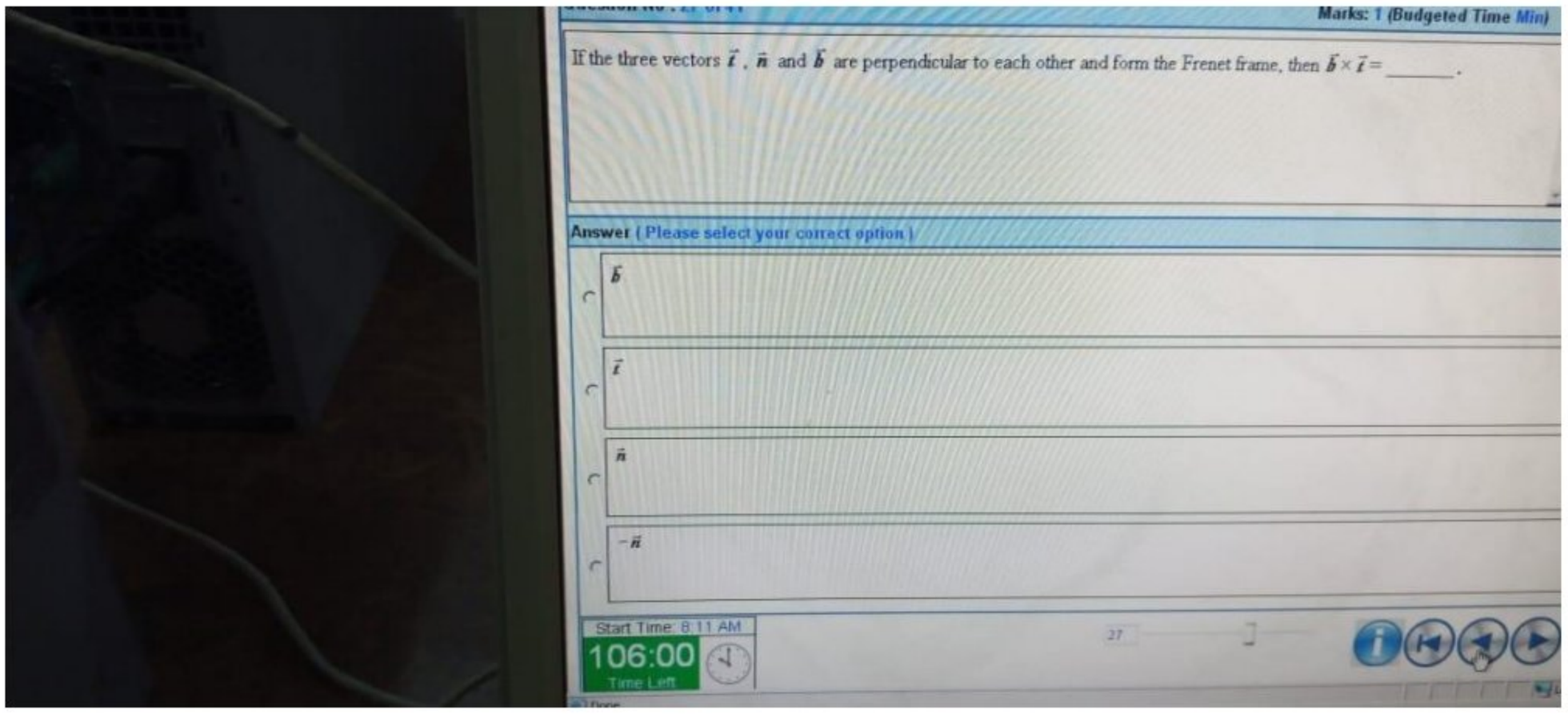
(c) $k\vec{0} = \vec{0}$

(d) both (b) and (c)

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MTH632 Complex Analysis and Differential Geometry

Question No : 29 of 41

A differentiable function from R^n to R^m is known as a____

Answer (Please select your correct option)

- injective
- mapping
- surjective
- bijective

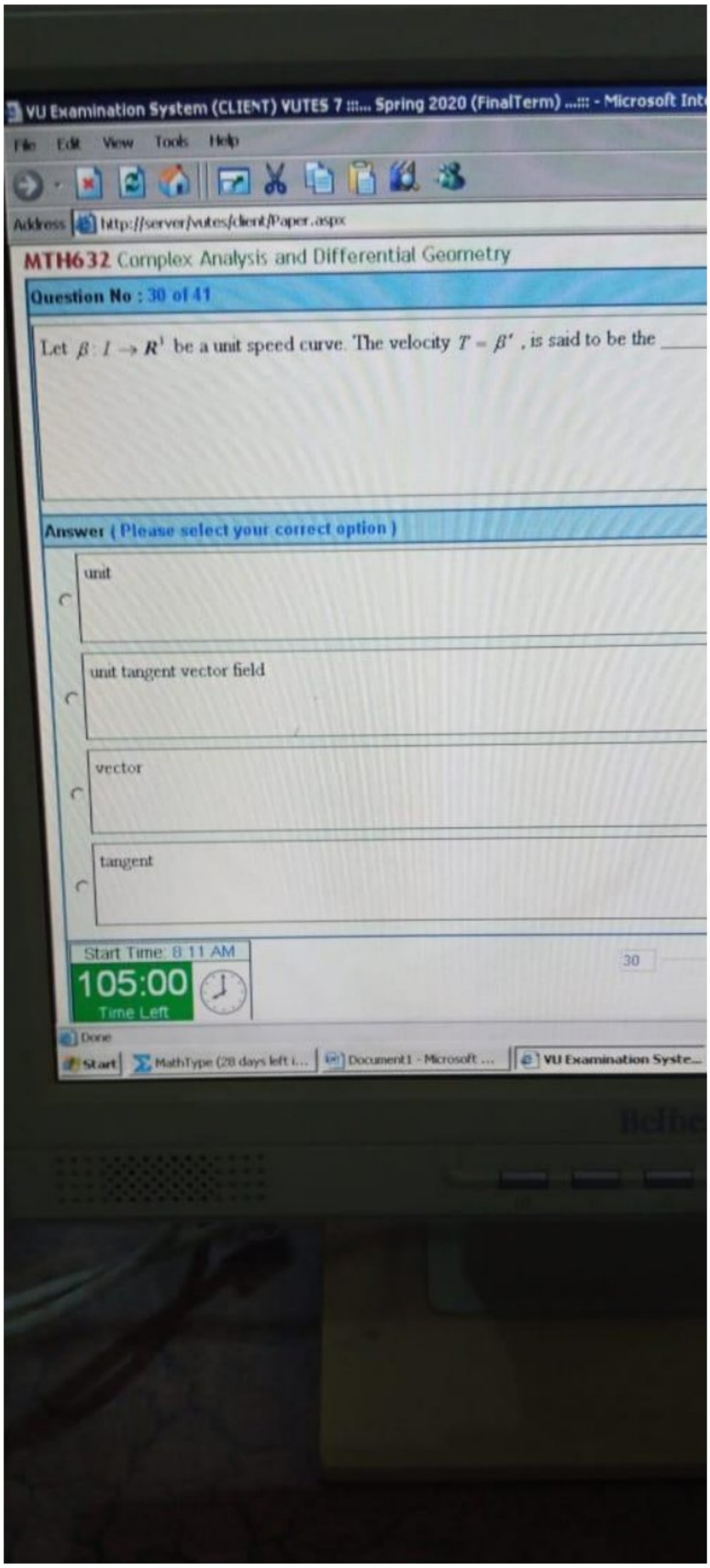
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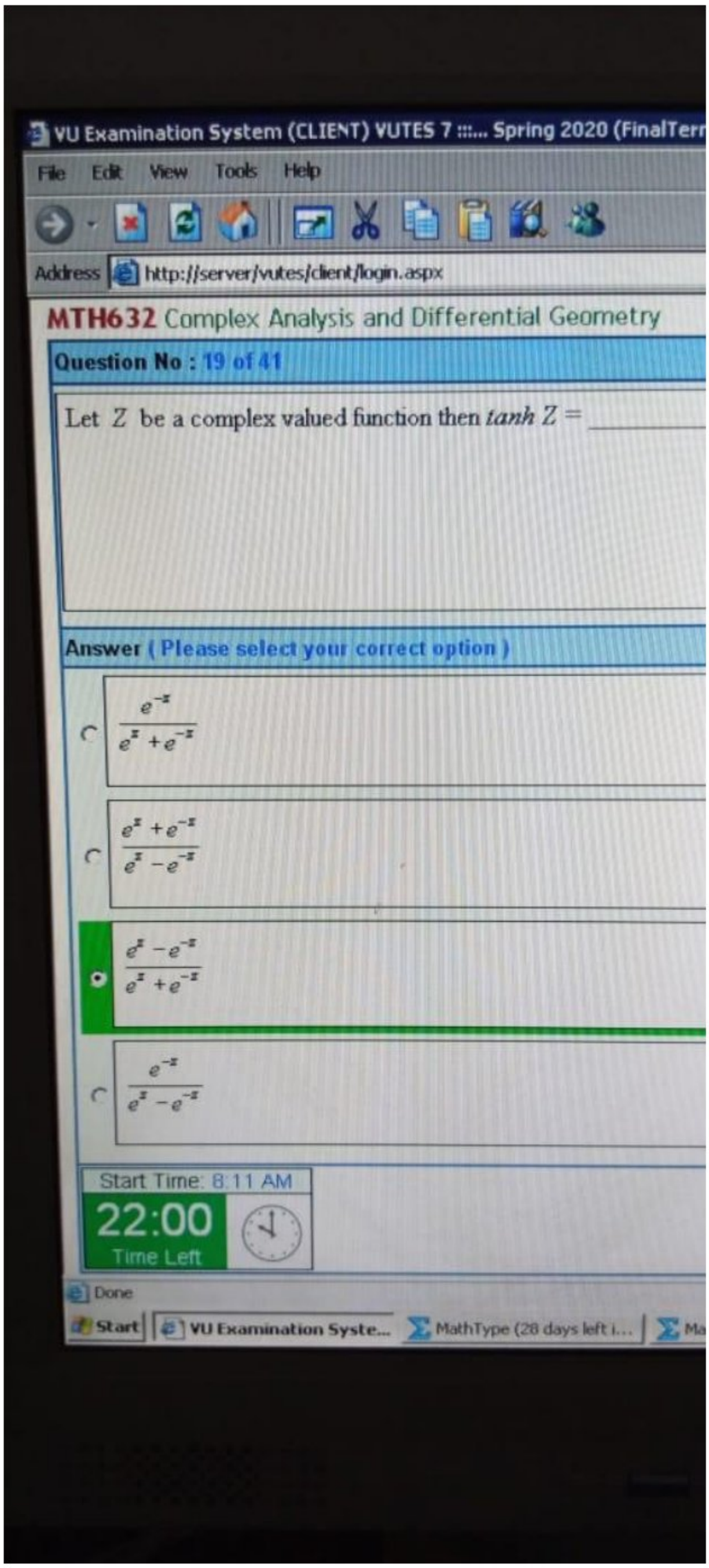
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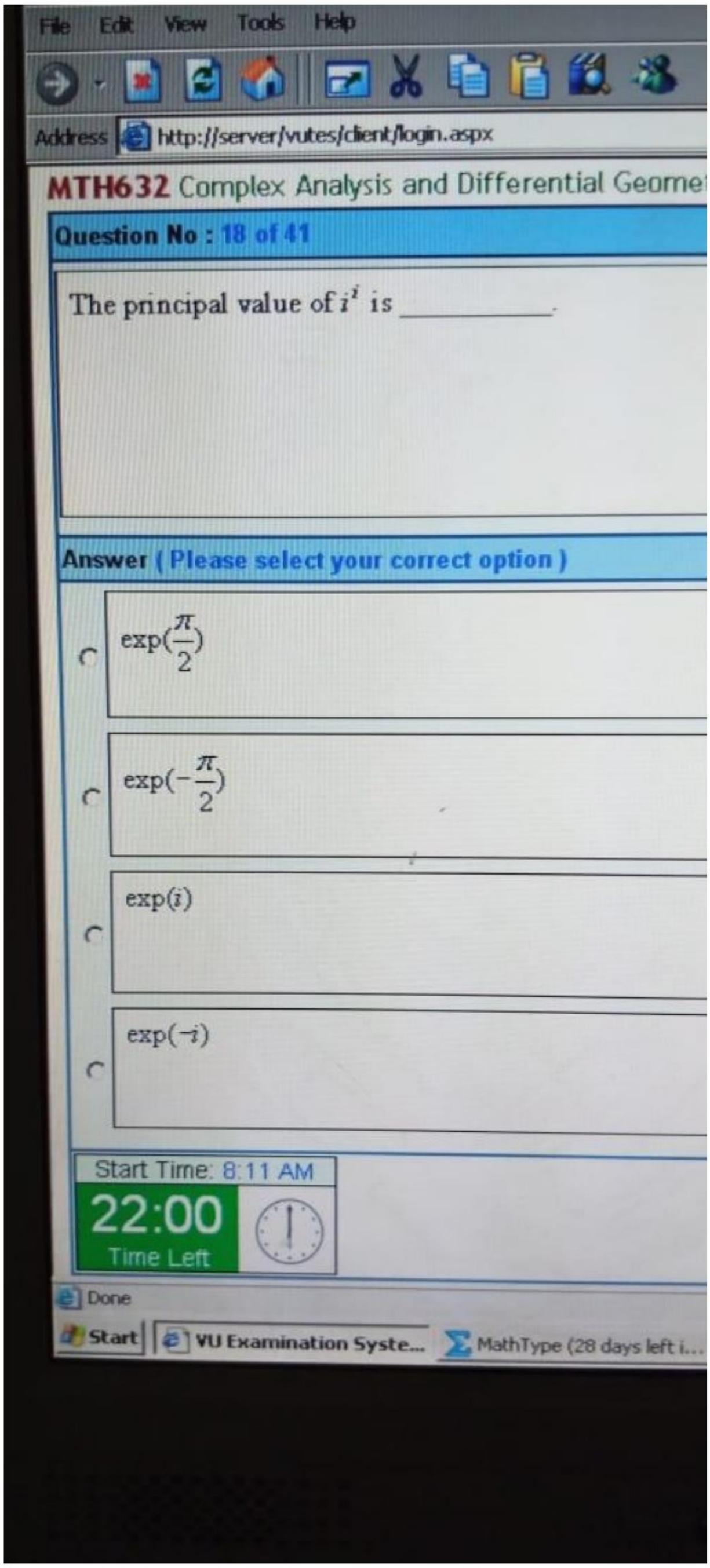
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Question No : 22 of 41 Marks: 1 (Budgeted Time

If $w(t)$ is a piecewise continuous complex-valued function defined on an interval $a \le t \le b$, then _____.

Answer (Please select your correct option)

- $\left|\int_a^b w(t)dt\right| \le \int_a^b |w(t)|dt$
- $\left|\int_a^b w(t)dt\right| \ge \int_a^b |w(t)|dt$
- $\left|\int_a^b w(t)dt\right| = \int_a^b |w(t)|dt$
- $\int_a^b w(t)dt \ge \left|\int_a^b |w(t)|dt\right|$

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MTH632 Complex Analysis and Differential Geometry

Question No : 41 of 41 MC1

Marks: 5 (Budgeted Time Min)

Let C_1 denote the positively oriented boundary of the square whose sides lie along the lines $x = \pm 1, y = \pm 1$ and let C_2 be the positively oriented circle $|z| = 4$ (given in Fig. below). Explain why $\int_{C_1} f(z)dz = \int_{C_2} f(z)dz$ where $f(z) = \dfrac{z+2}{\sin(z/2)}$?

Answer (Please click here to Add Answer)

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MTH632 Complex Analysis and Differential Geometry

Question No : 40 of 41 M

If $u = \log(x^2 + y^2)$ find v and $f(z)$ such that $f(z) = u + iv$ is analytic.

Answer (Please click here to Add Answer)

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MTH632 Complex Analysis and Differential Geometry

Question No : 39 of 41

Show that

(a) $Log(1+i)^2 = 2Log(1+i)$ and (b) $Log(-1+i)^2 \neq 2Log(-1+i)$

Answer (Please click here to Add Answer)

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MTH632 Complex Analysis and Differential Geometry

Question No : 38 of 41

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Let f and g be functions, ϕ and ψ be 1-forms. Then show that $d(fg) = df\,g + f\,dg$.

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MTH632 Complex Analysis and Differential Geometry

Question No : 36 of 41

Mar

If $\lim_{n\to\infty} z_n = z$ then by using the inequality, $||z_n| - |z|| \leq |z_n - z|$, show that $\lim_{n\to\infty} |z_n| = |z|$.

Answer (Please click here to Add Answer)

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MTH632 Complex Analysis and Differential Geometry

Question No : 37 of 41

Show that $\frac{d}{dz}(\text{arcsinh}(z)) = \frac{1}{\sqrt{1+z^2}}$.

Answer (Please click here to Add Answer)

MTH632 Complex Analysis and Differential Geometry

Question No : 37 of 41

Show that $\frac{d}{dz}(\text{arcsinh}(z)) = \frac{1}{\sqrt{1+z^2}}$.

Answer (Please click here to Add Answer)

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MTH632 Complex Analysis and Differential Geometry

Question No : 35 of 41

Evaluate $\lim_{z \to i} \frac{(z^2+4z+2)}{z+1}$.

Answer (Please click here to Add Answer)

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MTH632 Complex Analysis and Differential Geometry **MC1804**

Question No : 34 of 41 **Marks: 2 (Budgeted Time Min)**

If tangent vector along the helix $\vec{x}(t) = a(\cos t)\hat{e}_1 + a(\sin t)\hat{e}_2 + b(t)\hat{e}_3$, $a, b \neq 0$ is $\vec{x}'(t) = -a(\sin t)\hat{e}_1 + a(\cos t)\hat{e}_2 + b\hat{e}_3$.

Then evaluate the unit tangent vector $\vec{t}(s) = \dot{x} = \dfrac{\vec{x}'(t)}{|\vec{x}'(t)|}$.

Answer (Please click here to Add Answer)

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MTH632 Complex Analysis and Differential Geometry

Question No : 33 of 41

Evaluate the integral: $\int_1^2 \left(\frac{1}{t} - i\right)^2 dt$.

Answer (Please click here to Add Answer)

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MTH632 Complex Analysis and Differential Geometry

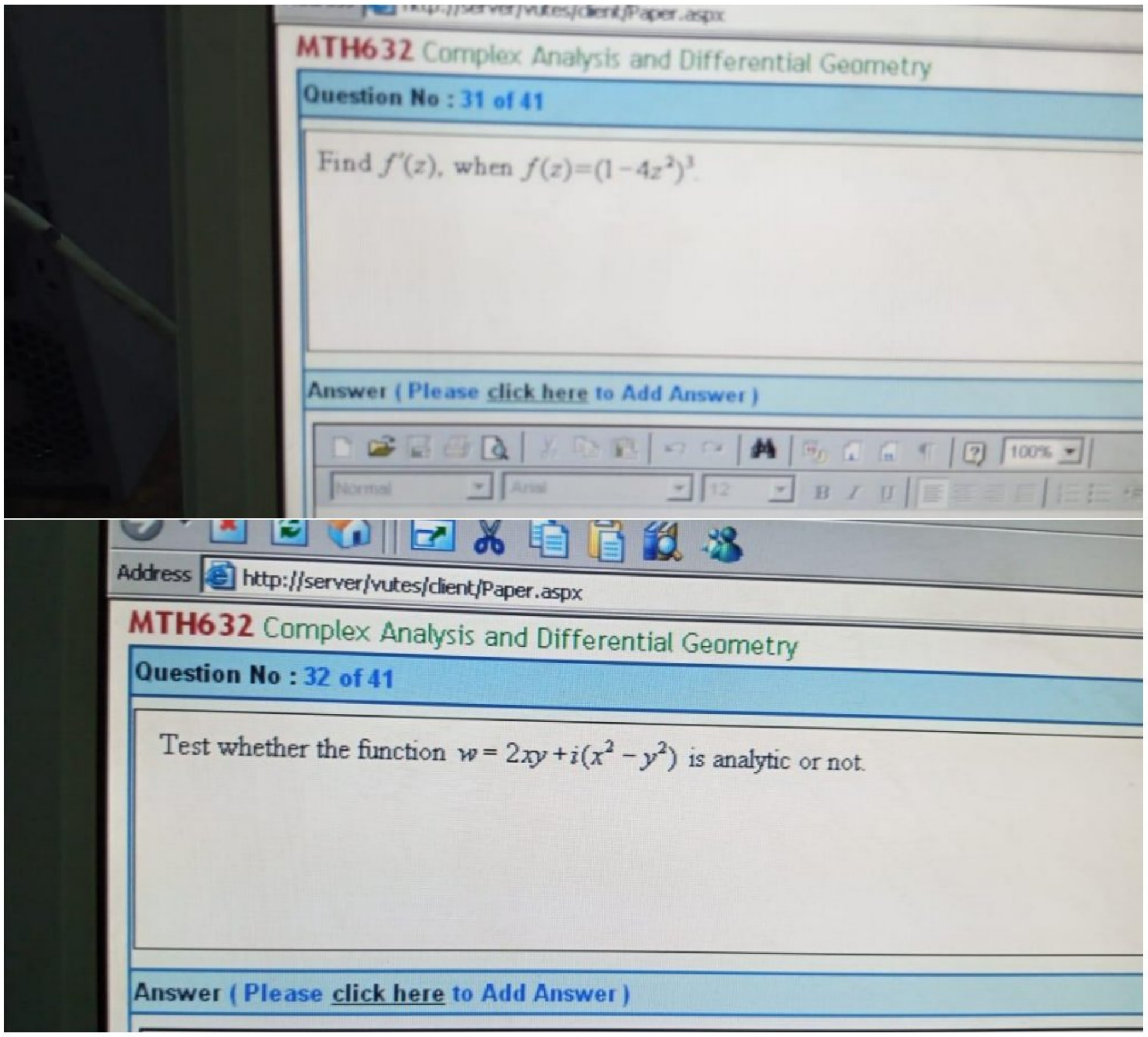
Question No : 32 of 41 **Marks**

Test whether the function $w = 2xy + i(x^2 - y^2)$ is analytic or not.

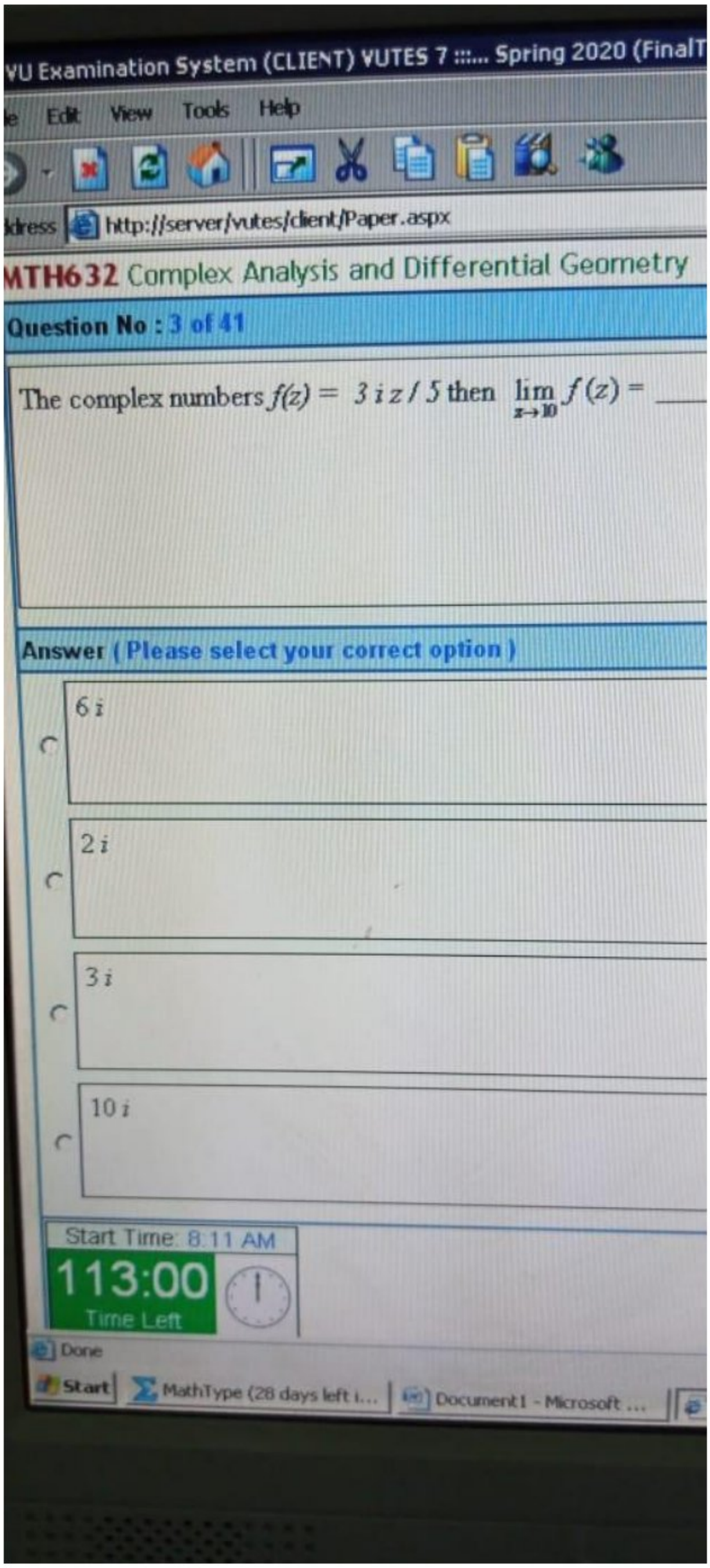
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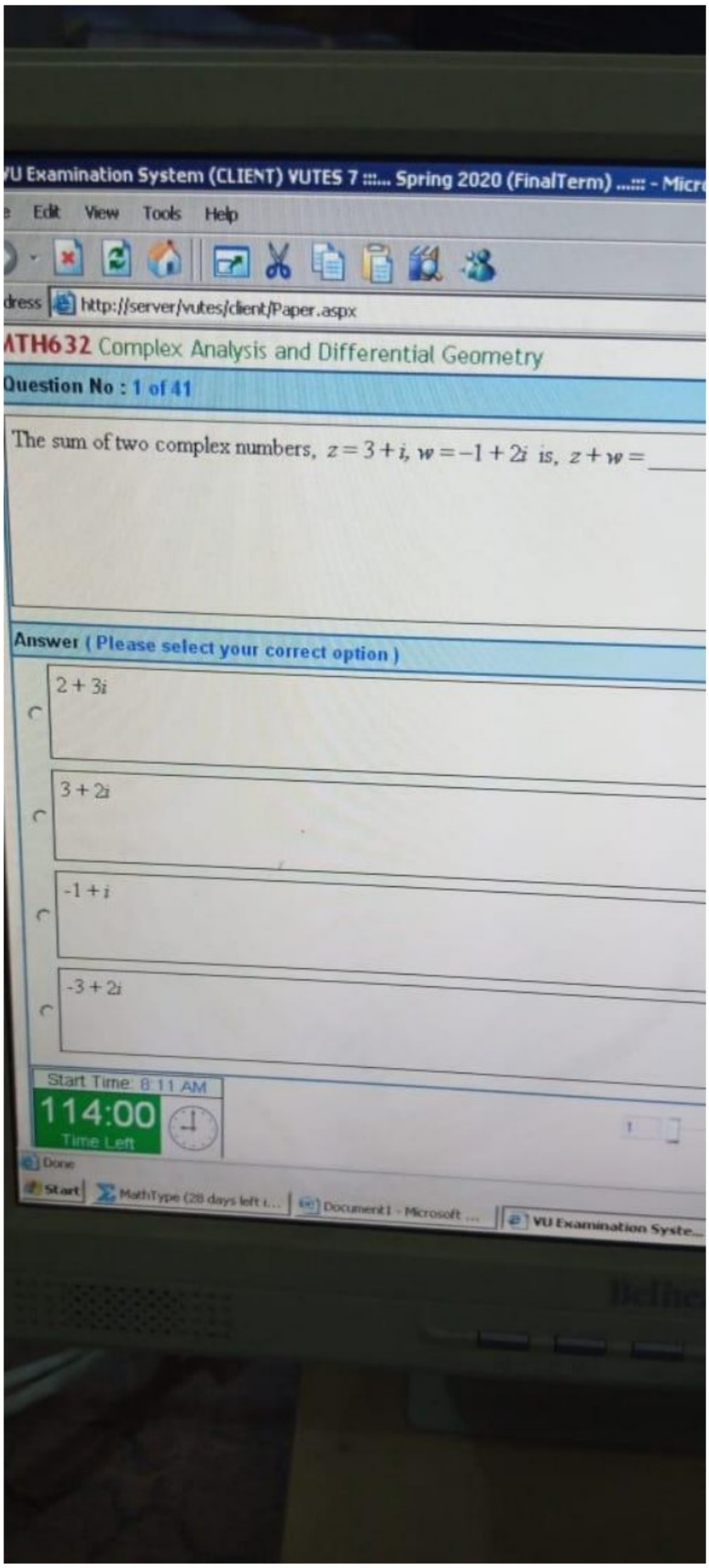
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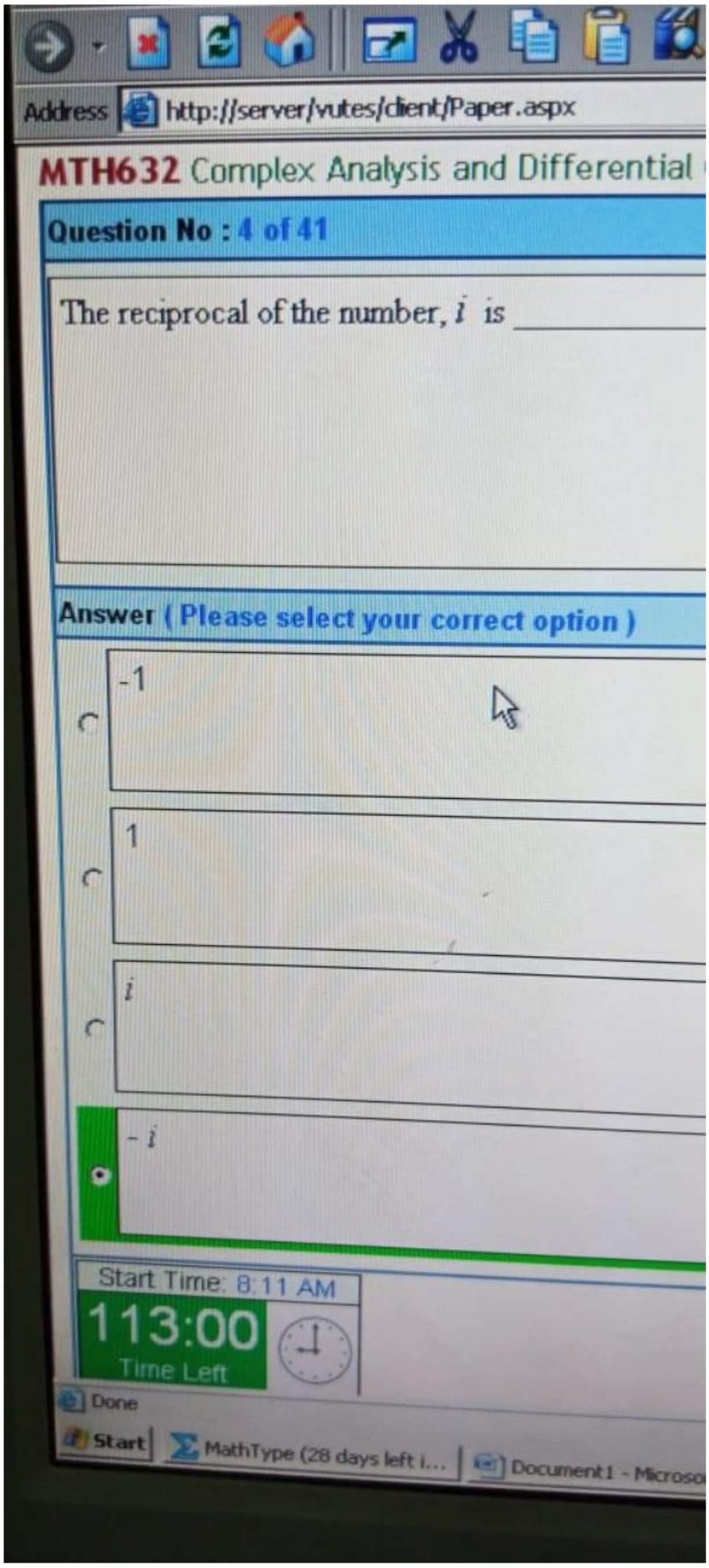
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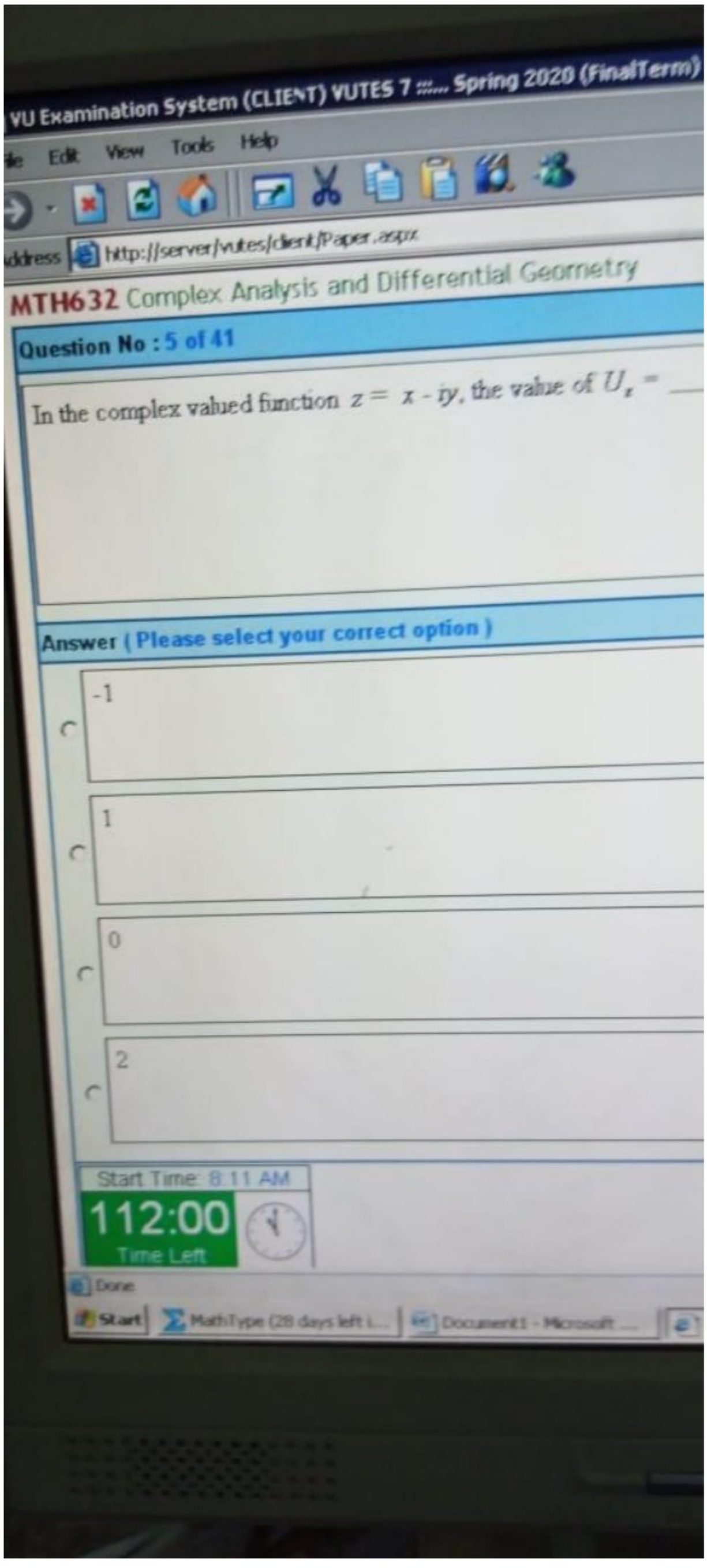
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MTH632 Complex Analysis and Differential Geometry

Question No : 6 of 41

The limit of $f(z) = 2z^2 - 4z + 2$ at $z = i$ is _____

Answer (Please select your correct option)

- $5i$
- $-4i$
- $2i$
- $-3i$

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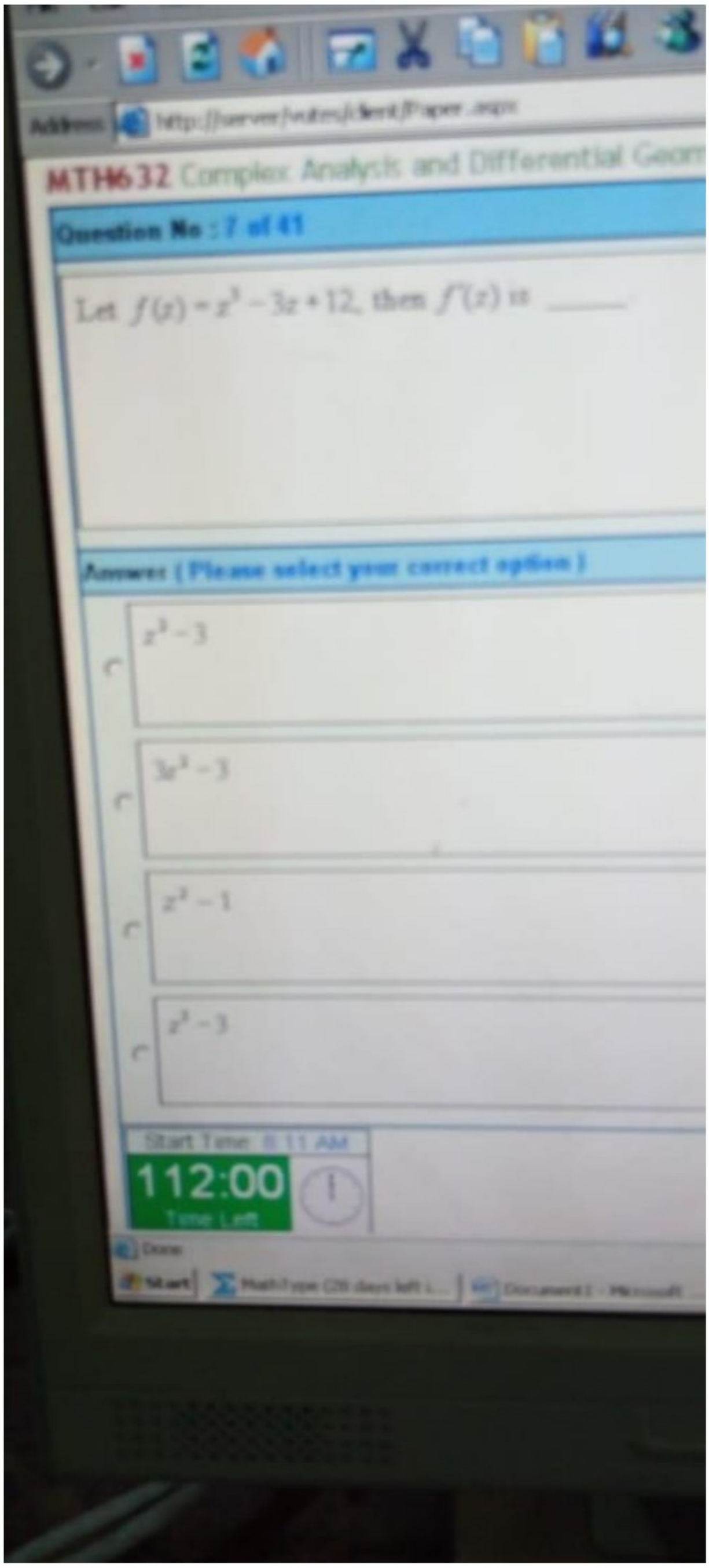
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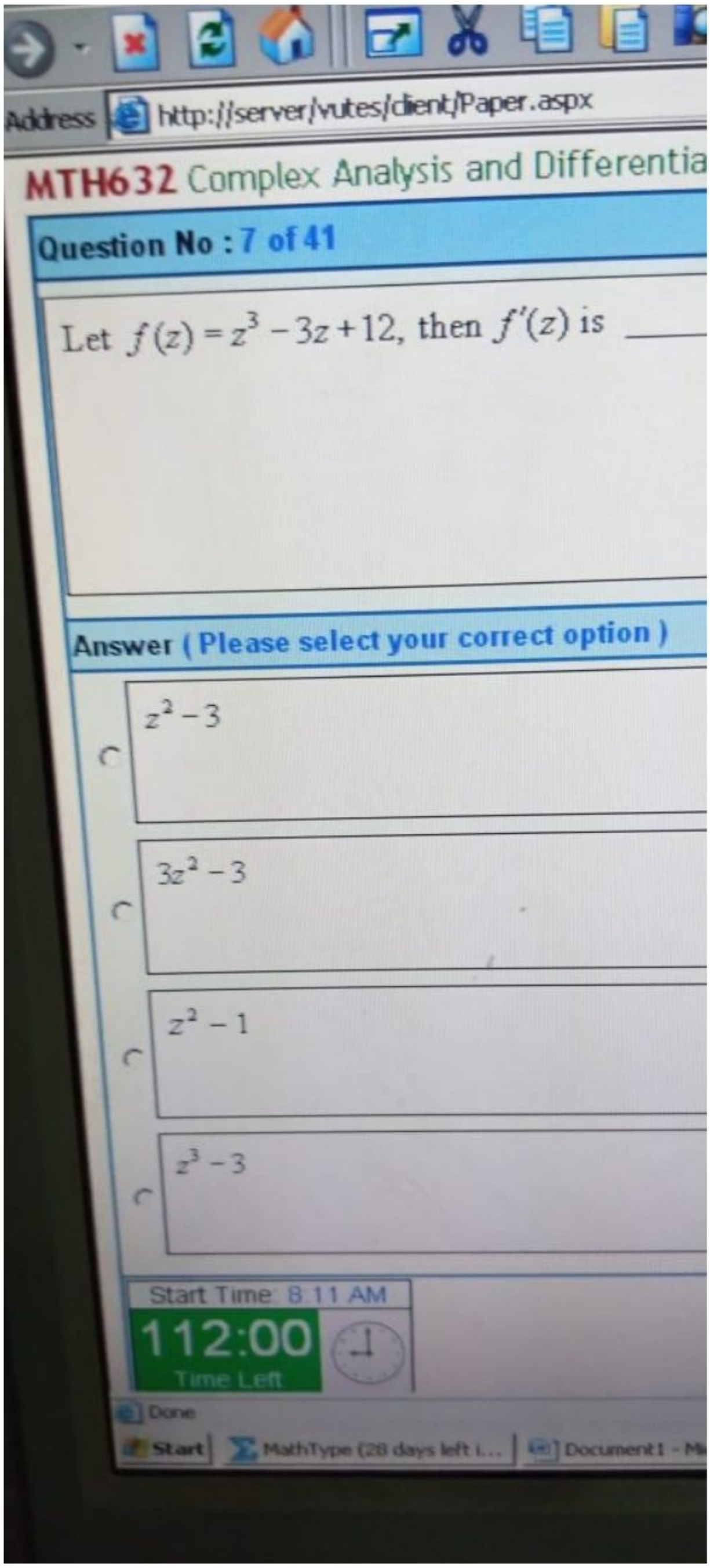
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Question No : 8 of 41 Marks: 1 (Budgeted Time

If a function $f(z) = u(x,y) + iv(x,y)$ is analytic in a domain D, then its component functions u and v are _____.

Answer (Please select your correct option)

- harmonic in D.
- equal in D.
- homogeneous in D.
- steady in D.

MTH632 Complex Analysis and Differential Geometry

Question No : 9 of 41 Marks: 1 (Bu

If Z_1 and Z_2 are two nonzero complex numbers then $Log(z_1 z_2)$ = _____.

Answer (Please select your correct option)

- $Log\, z_1\, Log\, z_2$
- $Log\, z_1 / Log\, z_2$
- $Log\, z_1 - Log\, z_2$
- $Log\, z_1 + Log\, z_2$

MTH632 Complex Analysis and Differential Geometry

Question No : 10 of 41 Marks: 1 (Budgeted Time Min)

The sequence $z_n = \frac{i}{n^2}$ $(n = 1,2,3,\ldots)$ for $n \to \infty$ converges to _____.

Answer (Please select your correct option)

- 1
- 0
- infinity
- 1/2

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MTH632 Complex Analysis and Differential Geometry

Question No : 12 of 41 **Marks: 1 (Budgeted Tim**

If a series of complex numbers converges, the n^{th} term converges to zero as n tends to _____.

Answer (Please select your correct option)

- infinity
- finite numbers

MTH632 Complex Analysis and Differential Geometry

Question No : 11 of 41 **Marks: 1 (Budgeted Time Min)**

If $f(z) = x + ay + i(bx + cy)$ is analytic, then a, b, c equals to _____.

Answer (Please select your correct option)

- $c=1$ and $a=-b$
- $a=1$ and $c=-b$
- $b=1$ and $a=-c$
- $a=b=c=1$

Question No : 13 of 41 **Marks: 1 (Budg**

If U and V are harmonic functions then $f(Z) = U + iV$ is _____.

Answer (Please select your correct option)

- analytic function.
- need not be analytic function.
- analytic function only at Z=0.
- none of the others.

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Question No : 15 of 41 Marks: 1 (Budgeted Time

A series converges to a number S if and only if the sequence of remainders tends to _____.

Answer (Please select your correct option)

- infinity
- one
- zero

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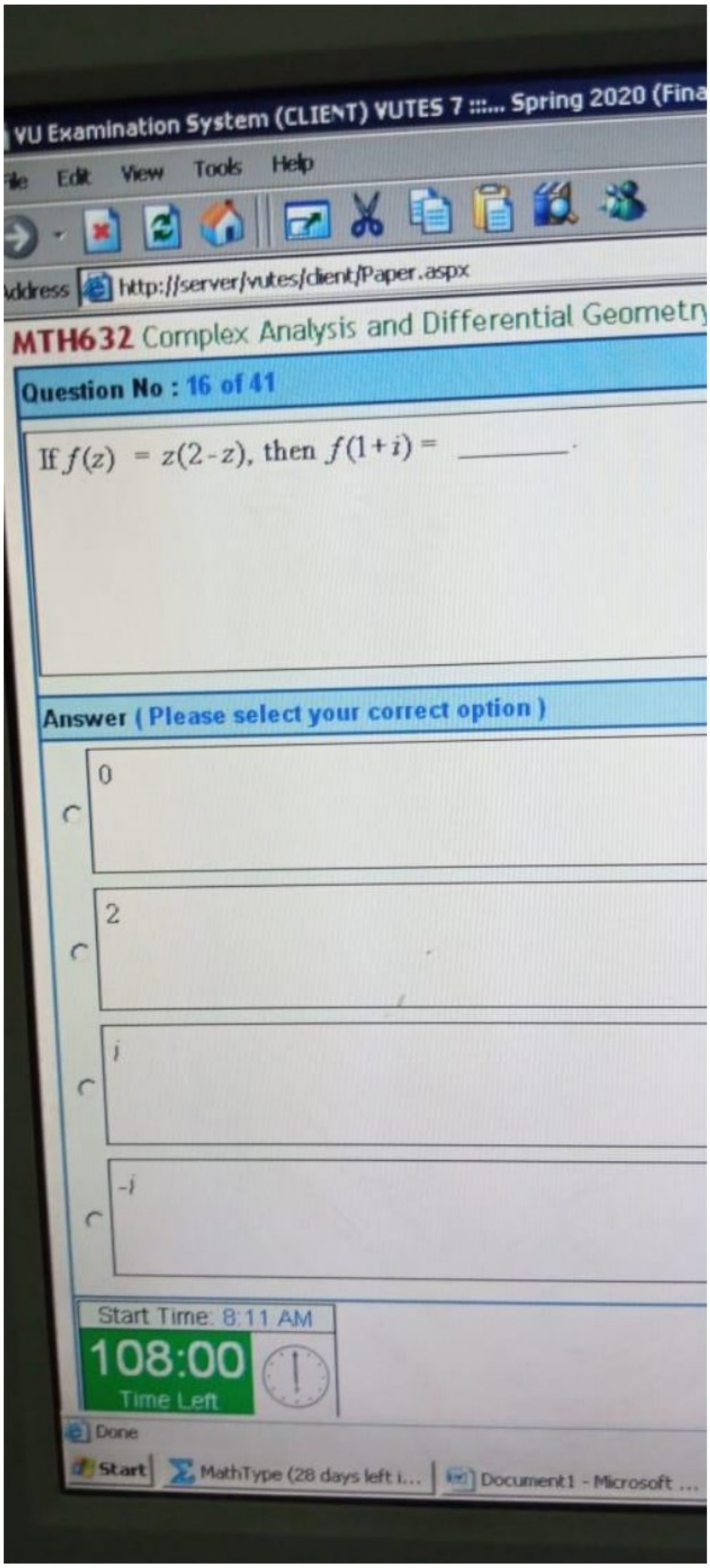
Question No : 14 of 41 Marks: 1

If $e^{ax} \cos y$ is harmonic then 'a' is _____.

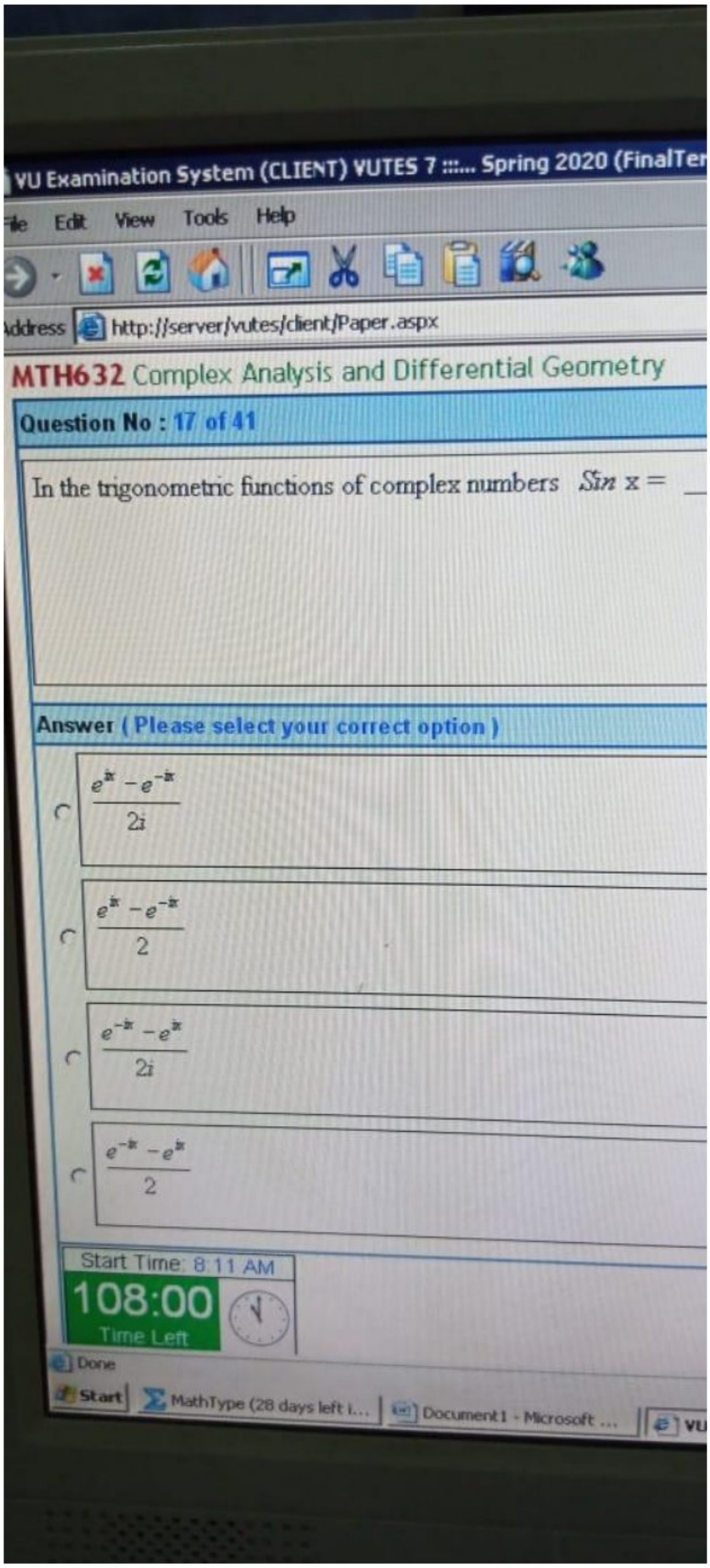
Answer (Please select your correct option)

- 0
- -1
- 2
- i

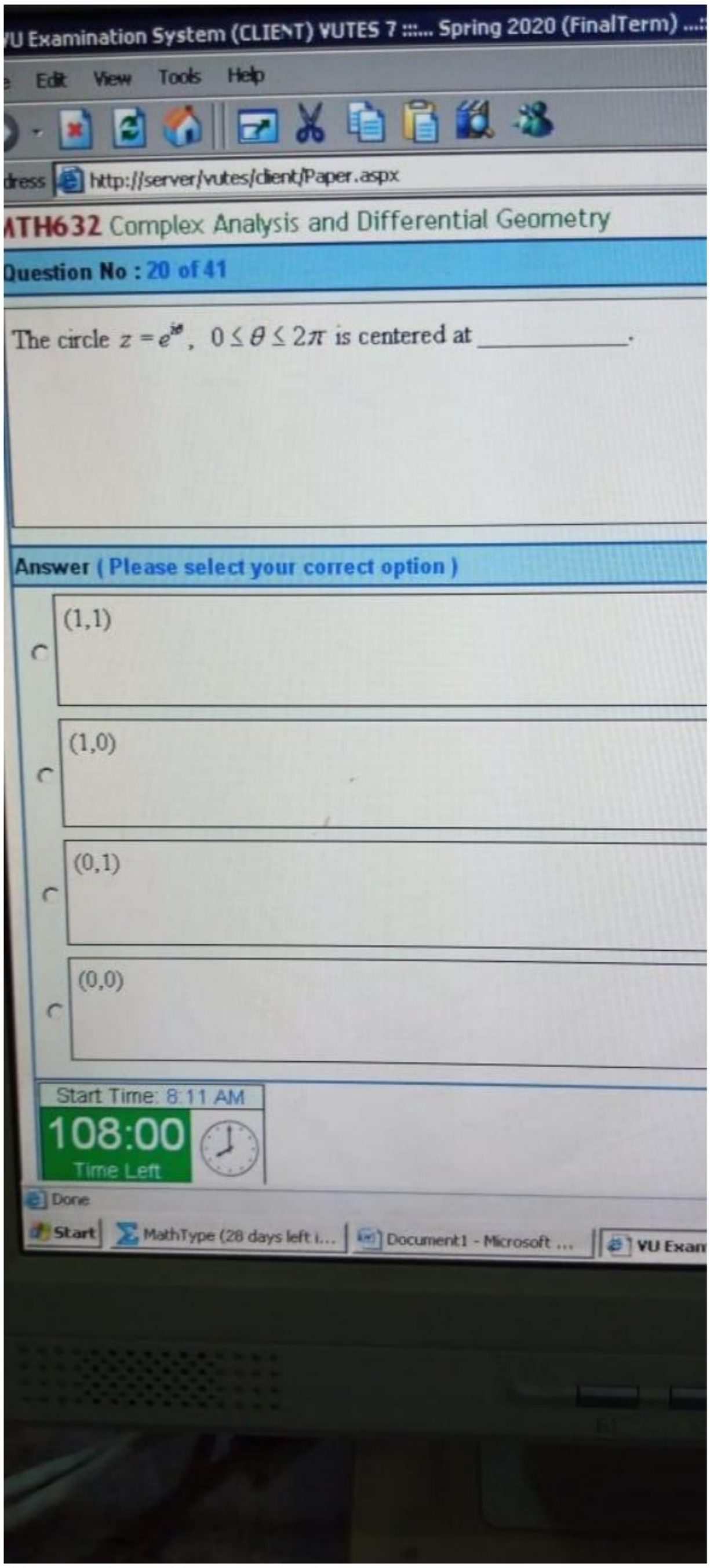
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Question No : 23 of 41 Marks: 1 (Budgeted Tin

Using the Cauchy–Goursat theorem when contour C is unit circle $\int_C \frac{z^2}{z-3}dz =$ _____

Answer (Please select your correct option)

- 3
- 0
- 1
- -3

MTH632 Complex Analysis and Differential

Question No : 24 of 41 Marks: 1 (Budgeted Time Min)

Let C be the positively oriented circle $|z|=2$. Since the function $f(z)=\frac{z}{9-z^2}$ is analytic within and on C and since the point $z_0=-i$ is interior to C, then using the Cauchy Integral formula $\int_C \frac{z}{(9-z^2)(z+i)}dz =$ _____

Answer (Please select your correct option)

- $\frac{\pi}{9}$
- $\frac{\pi}{5}$
- 2π
- $2\pi i$

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