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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

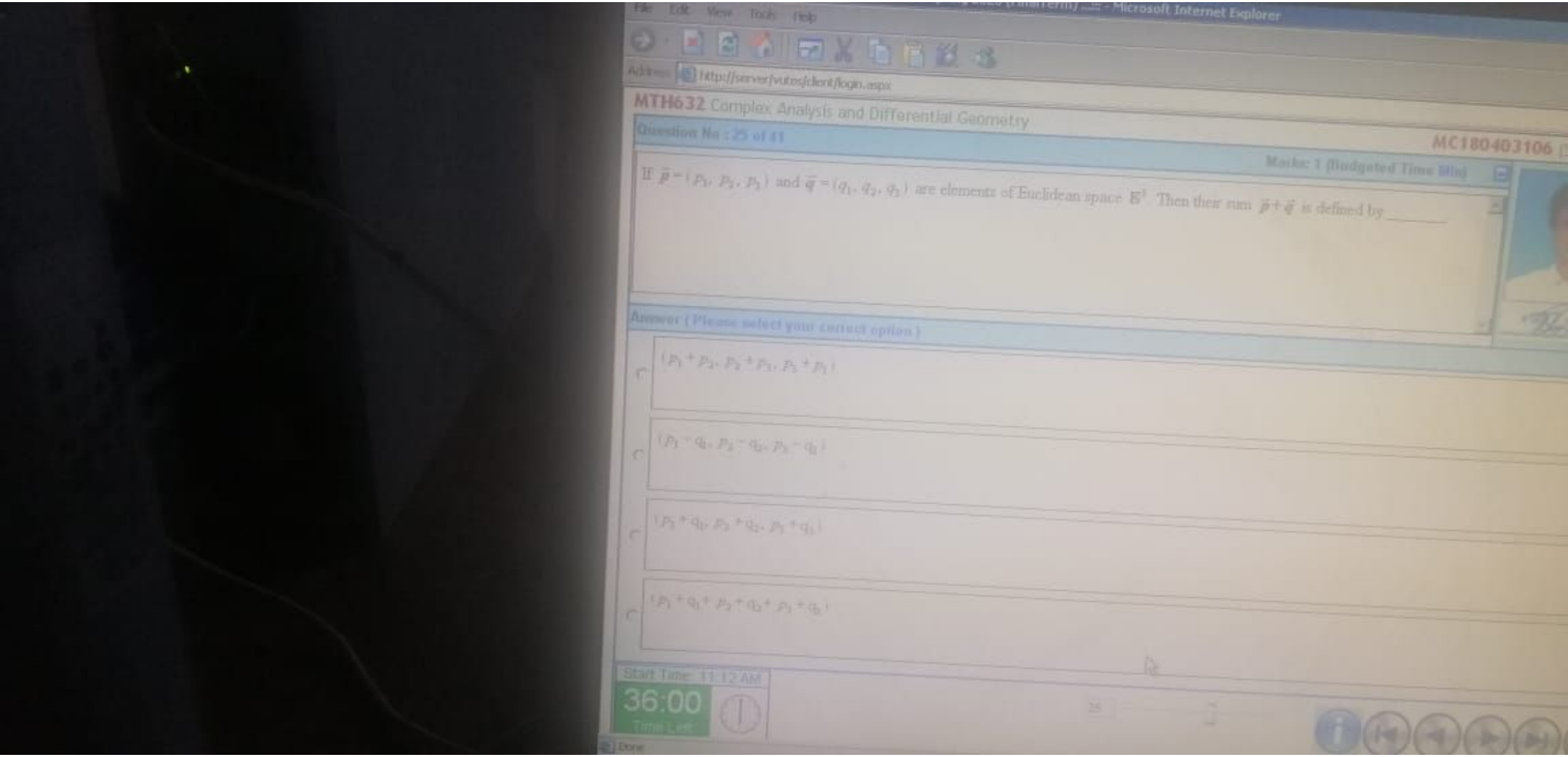
By using the Extension of Cauchy Integral formula $\int_z \frac{f(z)}{(z-z_0)^{n+1}} dz =$ _____

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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MTH632 Complex Analysis and Differential Geometry
Question No : 25 of 41
MC180403106
Marks: 1 (Budgeted Time: 1Min)
If $\vec{p} = (p_1, p_2, p_3)$ and $\vec{q} = (q_1, q_2, q_3)$ are elements of Euclidean space E^3. Then their sum $\vec{p} + \vec{q}$ is defined by _____
Answer (Please select your correct option)
C $(p_1 + p_2, p_2 + p_3, p_3 + p_1)$
C $(p_1 - q_1, p_2 - q_2, p_3 - q_3)$
C $(p_1 + q_1, p_2 + q_2, p_3 + q_3)$
C $(p_1 + q_1 + p_2 + q_2 + p_3 + q_3)$
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Question No : 30 of 41 **Marks: 1 (Budgeted Time Min)**

The restriction of a curve $\alpha: I \to R^1$ 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

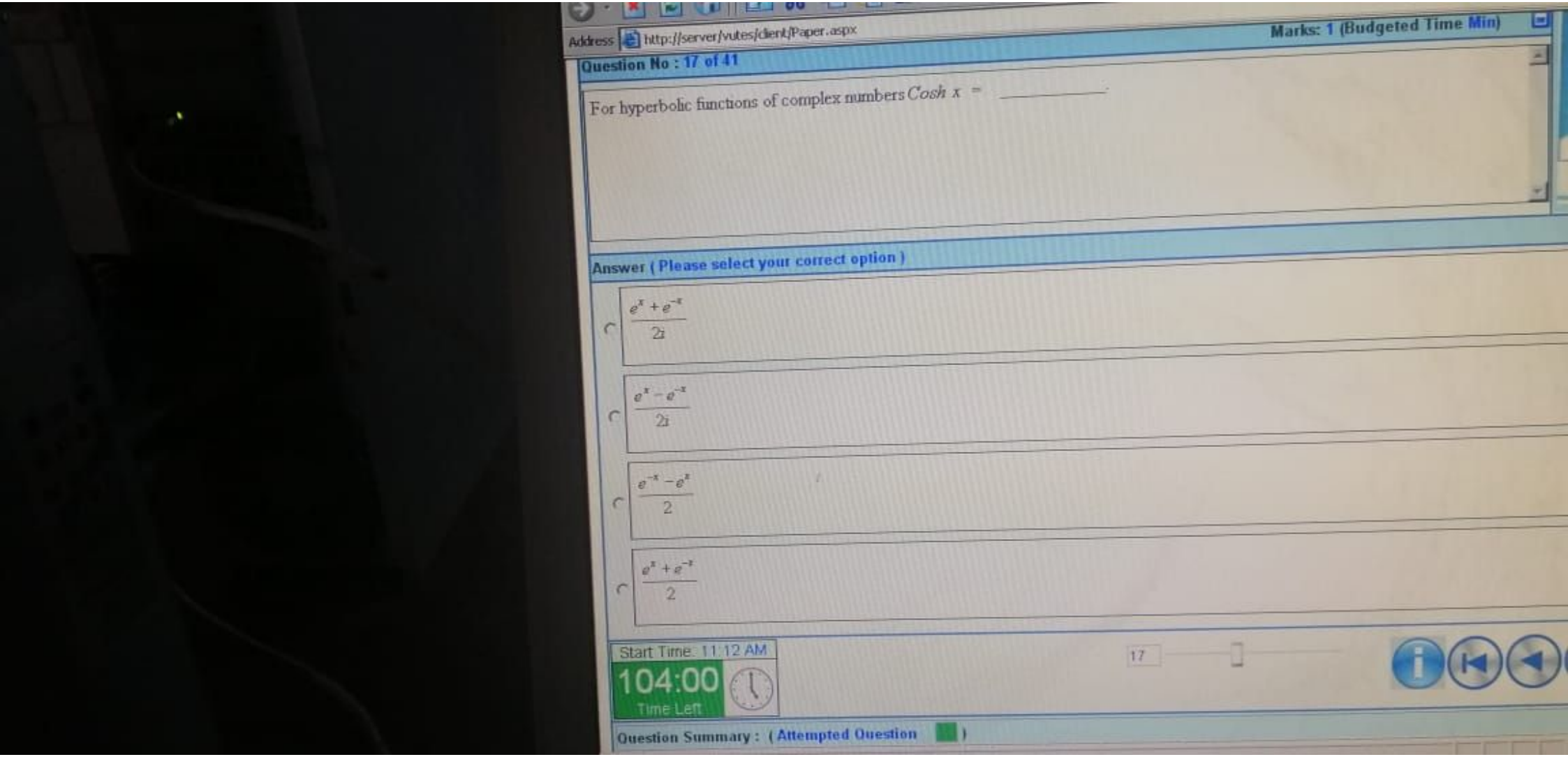
Question No : 20 of 41

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 option)
$\frac{e^x + e^{-x}}{2i}$
$\frac{e^x - e^{-x}}{2i}$
$\frac{e^{-x} - e^x}{2}$
$\frac{e^x + e^{-x}}{2}$
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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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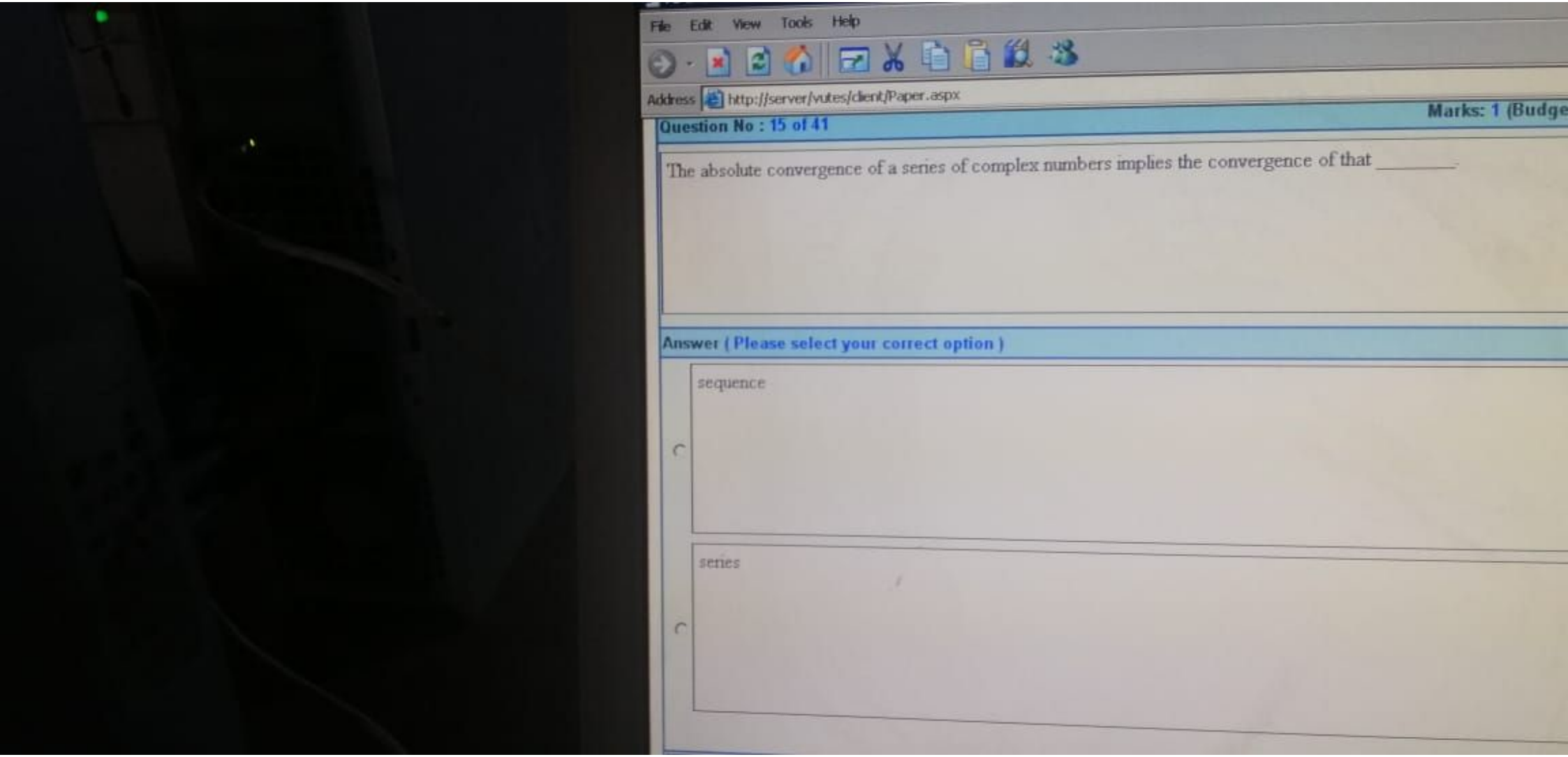
Question No : 16 of 41 **Marks: 1 (Budgeted Time Min)**

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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Address http://server/vutes/client/Paper.aspx
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 Mi**

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)

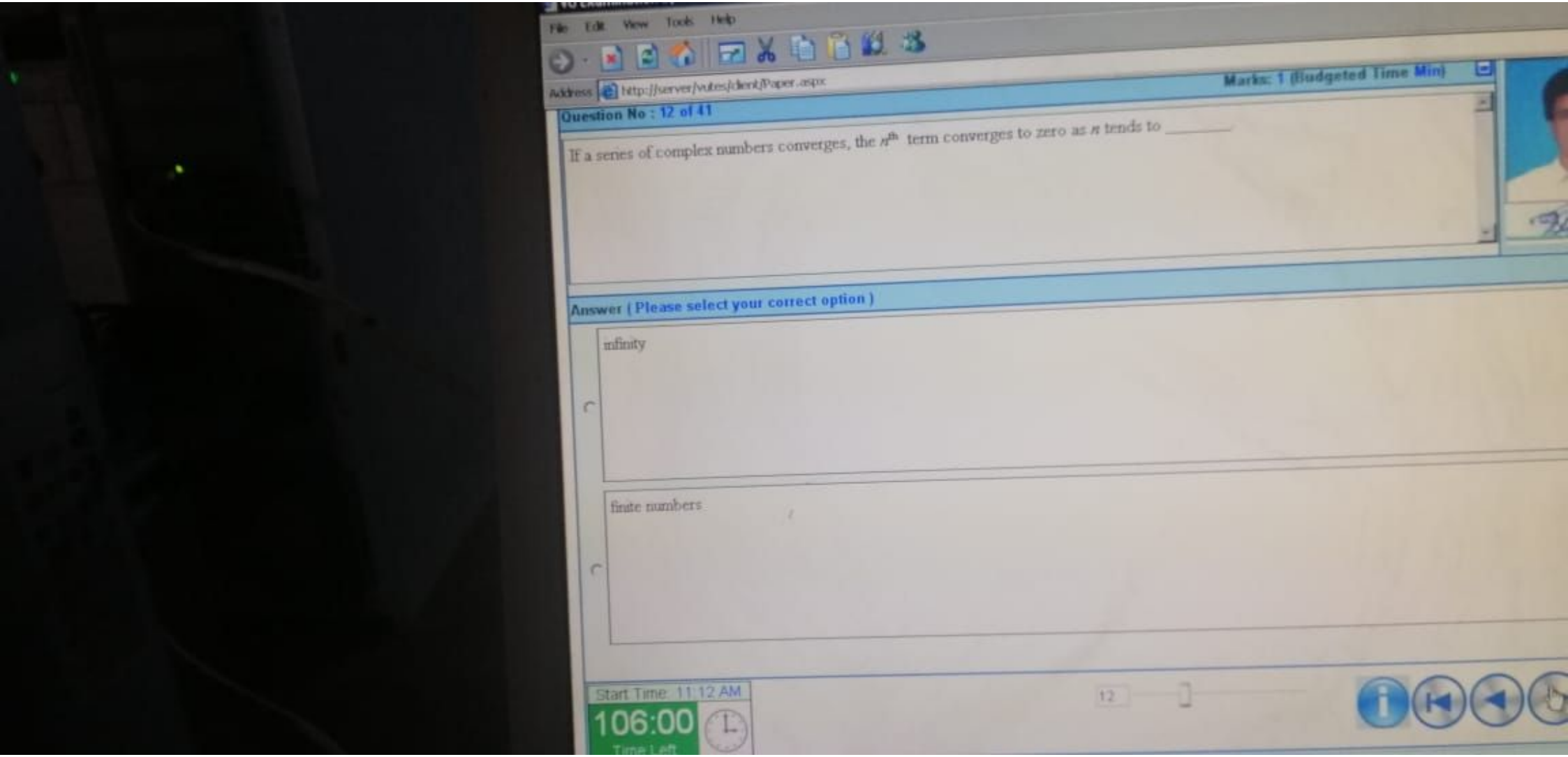
- analytic function.
- need not be analytic function.
- analytic function only at Z=0.
- none of the others.

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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 $p(z) = a_0 + a_1 z + a_2 z^2 + \ldots + a_n z^n \quad (a_n \neq 0)$ 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

MC18040310

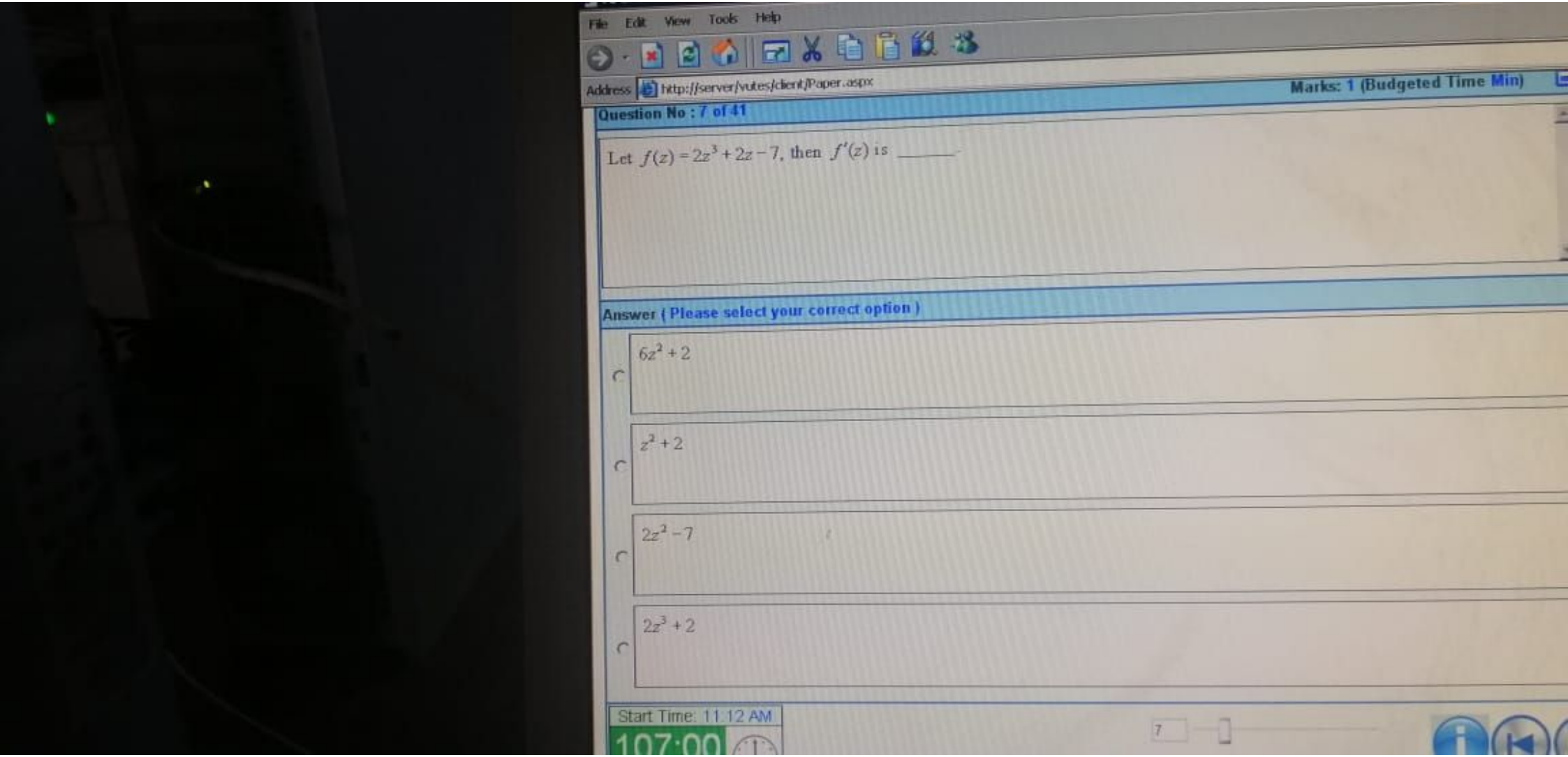
Question No : 6 of 41

Marks: 1 (Budgeted Time Min)

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

Answer (Please select your correct option)

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


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Address http://server/vutes/client/Paper.aspx
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 option)
$6z^2 + 2$
$z^2 + 2$
$2z^2 - 7$
$2z^3 + 2$
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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 option)

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

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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 M

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 **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)

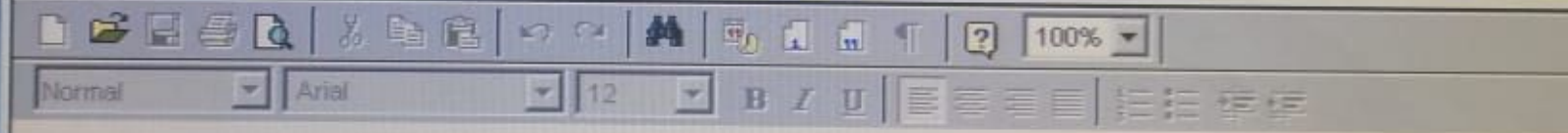
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MTH632 Complex Analysis and Differential Geometry

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**

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)

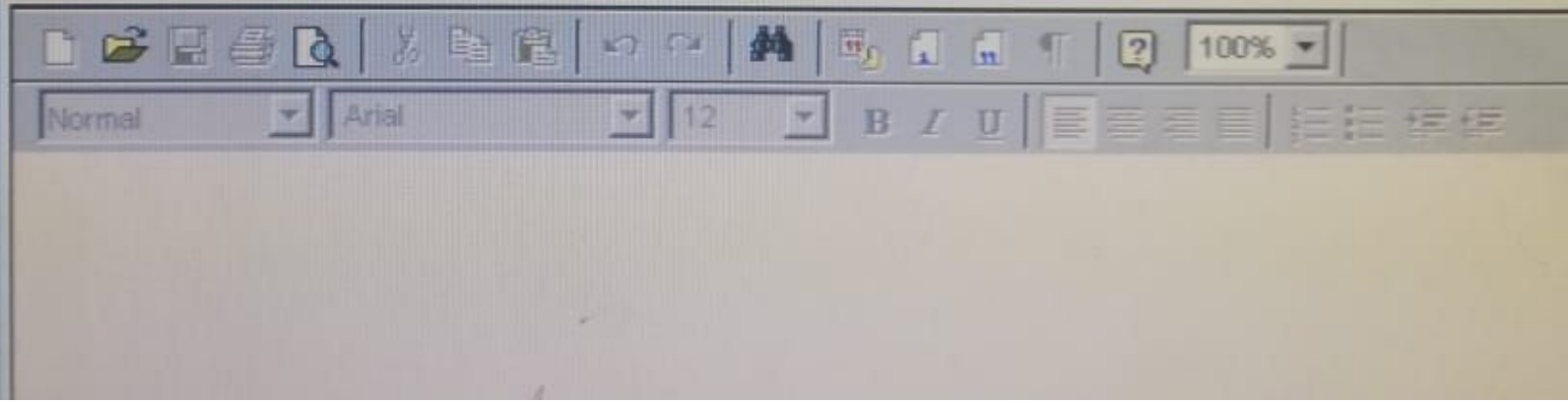
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MTH632 Complex Analysis and Differential Geometry

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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