

- 1) In general, $1^{1/n}$ is ----- $\exp\left(\frac{2k\pi}{n}i\right), k = 0, 1, 2, 3, \dots, n-1$
- 2) the third root of $2i$ is ----- $\sqrt[3]{2}\left[i\left(\frac{\pi}{6} + \frac{2k\pi}{3}\right)\right], k \in \mathbb{Z}$
- 3) The distance b/t two complex numbers Z_1 and Z_2 is ----- $|Z_1 - Z_2|$
- 4) The derivative of f at Z_0 i.e. $f' = \lim_{z \rightarrow z_0} \left(\frac{f(z) - f(z_0)}{z - z_0} \right)$ provided the limit exists. The function must be defined in a neighborhood of ----- Z_0
- 5) A closed disc with center Z_0 and radius ϵ is defined by ----- $|Z - Z_0| \leq \epsilon$
- 6) Consider $\lim_{z \rightarrow z_0} g(z) = B$. Then $\lim_{z \rightarrow z_0} (f(z)g(z)) =$ ----- AB
- 7) IF $f(z)=z^2, g(z)=1/z$, then $g(f(3))=$ ----- $1/9$
- 8)) The third cube roots of the number $-8i$ are ----- $2\exp\left[i\left(-\frac{\pi}{6} + \frac{2k\pi}{3}\right)\right], k = 0, 1, 2$
- 9) If $f(z)=z^3, g(x)=z+2$, then $g(f(5))=$ ----- 127
- 10) If $f(z)=z^3, g(x)=z+2$, then $g(f(4))=$ ----- 66
- 11) If U and V are harmonic functions then $f(Z)=U+iV$ is ----- **analytic func.**
- 12) Harmonic conjugate of $u(x,y)=e^y \cos x$ is ----- **$e^y \sin x + c$**
- 13) A point at which a func. Ceases to be analytic is called a ----- **singular point.**
- 14) A func. V is said to be harmonic if and only if ----- **$V_{xx} + V_{yy} = 0$**
- 15) Consider $\lim_{z \rightarrow z_0} f(z) = A$ and $\lim_{z \rightarrow z_0} g(z) = B$. Then $\lim_{z \rightarrow z_0} \frac{f(z)}{g(z)} =$ ----- **$\frac{A}{B}, B \neq 0$**
- 16) In the complex valued function $Z=X-iY$, the value of $V_x=$ ----- **0**

- 17) If $f(z) = X + aY + i(bX + cY)$ is analytic, then a, b, c equals to **$c=1$ and $a=-b$**
- 18) The sequence $Z_n = -3 + i \frac{1}{n^2} (n = 1, 2, 3, \dots)$ for $n \rightarrow \infty$ convergence to..... **-3**
- 19) The Cauchy-Riemann equation on a pair of real-valued functions of two real variables $u(x, y)$ and $v(x, y)$ are $U_x = V_y$ and
 $U_y = -V_x$
- 20) If $e^{ax} \cos y$ is harmonic then 'a' is **i**
- 21) If Cauchy-Riemann equations are not satisfied at a point Z_0 then func. is not at Z_0
differentiable
- 22) In the complex valued func. $Z = x - iy$, the value of $U_x =$ **1**
- 23) In the complex valued func. $Z = x - iy$, the value of $V_x =$ **0**
- 24) Consider $\lim_{z \rightarrow z_0} f(z) = A$ and $\lim_{z \rightarrow z_0} g(z) = B$. Then $\lim_{z \rightarrow z_0} (f(z) \pm g(z)) =$ **$A \pm B$**
- 25) A func. $F(z)$ is analytic func. If part $f(z)$ is analytic **both (a) and (b)**
- 26) Any polynomial $p(z) = a_0 + a_1z + a_2z^2 + \dots + a_nz^n (a_n \neq 0)$ of degree $n (n \geq 1)$ has least one zero, i.e. there exists at least Z_0 such that $P(Z_0) = 0$ **one point**
- 27) Each simple closed curve C divides the plane into two domains (Connected Open Sets). One of the which is unbounded and is called of C **Exterior**
- 28) A curve C is said to be a contour if it is constructed by joining finitely many smooth curves end to end
True
- 29) A domains (Connected Open Sets) is called connected if interior of every simple closed contour C is contained in D **simply**

- 30) if we write $\Delta_z = z - z_0$ then the func. $f'(z_0) = \lim_{z \rightarrow z_0} \left(\frac{f(z) - f(z_0)}{z - z_0} \right)$ can be expressed as $f'(z_0) = \lim_{\Delta_z \rightarrow 0} \left(\frac{f(z_0 + \Delta_z) - f(z_0)}{\Delta_z} \right)$.
- 31) If $f(z) = u + iv$ in polar form is analytic then $\frac{\partial u}{\partial r}$ is $\frac{1}{r} \frac{\partial v}{\partial \theta}$.
- 32) If $f(z) = u + iv$ in polar form is analytic then $\frac{\partial u}{\partial \theta}$ is $-r \frac{\partial v}{\partial r}$.
- 33) A func. v is called a conjugate harmonic func. For a harmonic func. u in Ω whenever $f = u + iv$ is analytic.
- 34) The func. $f(x + iy) = x^4 + ax^2y + bxy^2 + cy^4$ is analytic if $a = 3i, b = -3$ and $c = i$.
- 35) There exist no analytic func. f such that $\text{Re } f(z) = y^2 - 2x$.
- 36) The harmonic conjugate of $u(x, y) = 2x(1 - y)$ is $x^2 - y^2 + 2y + c$.
- 37) The harmonic conjugate of $2x - x^3 + 3xy^2$ is $2y - 3x^2y + y^3$.
- 38) If the real part of an analytic func. $f(z)$ is $x^2 - y^2 - y$, then imaginary part is $2xy + x$.
- 39) If the imaginary part of an analytic func. $f(z)$ is $2xy + y$, then real part is $x^2 - y^2 + x$.
- 40) $f(z) = \bar{z}$ is differentiable nowhere.
- 41) $f(z) = |\bar{z}|^2$ is differentiable only at $z = 0$ (but not analytic at $z = 0$).
- 42) If $f(z) = \begin{cases} \frac{xy}{x^2 + y^2}, & \text{if } z \neq 0 \\ 0 & \text{if } z = 0 \end{cases}$ then $f(z)$ is not diff. at $z = 0$.
- 43) $f(z) = e^z$ is analytic everywhere.



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Question # 1 of 5

SOLVED BY: **WAQAR HUSSAIN**

$$\lim_{(x,y) \rightarrow (1,2)} 3xy^2 - y = \underline{\hspace{2cm}}$$

Select the correct option

PRESENTED BY: **TALEEMI MARKAZ**



8



10

(Pg.598)



9



11





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Question # 2 of 5

SOLVED BY: **WAQAR HUSSAIN**

If $f(z) = z^2$, then $f(x + iy) = \underline{\hspace{2cm}}$.

Select the correct option

PRESENTED BY: **TALEEMI MARKAZ**



$$x^2 - y^2 + 2xyi$$

(Pg.571)



$$x^2 - y^2 - 2xyi$$



$$x^2 + y^2 - 2xyi$$



$$x^2 + y^2i - 2xyi$$





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Question # 3 of 5

SOLVED BY: **WAQAR HUSSAIN**

If f approaches two complex numbers $L_1 \neq L_2$ for two different curves or paths through z_0 then the $\lim_{z \rightarrow z_0} f(z)$ _____.

Select the correct option

PRESENTED BY: **TALEEMI MARKAZ**



does not exist

(Pg.542)



exists





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Question # 4 of 5

SOLVED BY: **WAQAR HUSSAIN**

Consider $\lim_{z \rightarrow z_0} f(z) = A$ and $\lim_{z \rightarrow z_0} g(z) = B$. Then $\lim_{z \rightarrow z_0} (f(z)g(z)) = \underline{\hspace{2cm}}$.

Select the correct option

PRESENTED BY: **TALEEMI MARKAZ**



$$A - B$$



$$A \pm B$$



$$A + B$$



$$A \cdot B$$



(Pg.597)



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Question # 5 of 5

SOLVED BY: **WAQAR HUSSAIN**

A complex-valued linear transformation could be a composition of _____.

Select the correct option

PRESENTED BY: **TALEEMI MARKAZ**

☐	translation	
☐	magnification	
☒	all of the above	 (Pg.400)
☐	rotation	



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Question # 1 of 5

SOLVED BY: WAQAR HUSSAIN

Mapping is _____ way of visualizing a given function.

Select the correct option

PRESENTED BY: TALEEMI MARKAZ



an analytical



a numerical



none of the above



a geometrical



(Pg.478)



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Question # 2 of 5

SOLVED BY: **WAQAR HUSSAIN**

$$|z_1 - z_2| =$$

Select the correct option

PRESENTED BY: **TALEEMI MARKAZ**



$$> |z_1| + |z_2|$$



$$> z_1 + z_2$$



$$\leq z_1 + z_2$$



$$\leq |z_1| + |z_2|$$



(Pg.78)



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Question # 3 of 5

SOLVED BY: **WAQAR HUSSAIN**

What is the modulus of the complex number $-6 + 8i$?

Select the correct option

PRESENTED BY: **TALEEMI MARKAZ**



14



10

(Pg.71)



-10



6





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Question # 4 of 5

SOLVED BY: **WAQAR HUSSAIN**

A complex-valued function of the form $L(z) = Az + B$, where $A, B \in \mathbb{C}$, represents a _____ transformation.

Select the correct option

PRESENTED BY: **TALEEMI MARKAZ**

☐	cubic	
☐	quadratic	
☐	none of the above	
☒	linear	

(Pg.338)



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Question # 5 of 5

SOLVED BY: **WAQAR HUSSAIN**

Consider $\lim_{z \rightarrow z_0} f(z) = A$ and $\lim_{z \rightarrow z_0} g(z) = B$. Then $\lim_{z \rightarrow z_0} \frac{f(z)}{g(z)} = \underline{\hspace{2cm}}$.

Select the correct option

PRESENTED BY: **TALEEMI MARKAZ**



$$A - B$$



$$\frac{A}{B}, B \neq 0$$

(Pg.597)



$$A + B$$



$$A \cdot B$$





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Question # 1 of 5

SOLVED BY: **WAQAR HUSSAIN**

In $z = a + bi$, if i is replaced by $-i$, then another complex number obtained is said to be

Select the correct option

PRESENTED BY: **TALEEMI MARKAZ**



prime factor of z



Complex conjugate of z

(Pg.83)



additive inverse of z



multiplicative inverse of z





MTH632: Quiz 1



Question # 2 of 5

SOLVED BY: **WAQAR HUSSAIN**

Product of complex numbers $(3 + 2i)$ and $(1 + 7i)$ is _____.

Select the correct option

PRESENTED BY: **TALEEMI MARKAZ**



$$-11 + 23i$$

(Pg.32)



$$4 + 9i$$



$$3 + 14i$$



$$3 + 9i$$





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Question # 3 of 5

SOLVED BY: WAQAR HUSSAIN

The three cube roots of the number $-8i$ are

Select the correct option

PRESENTED BY: TALEEMI MARKAZ



$$2\exp\left[i\left(-\frac{\pi}{6} + \frac{2k\pi}{3}\right)\right], k = 0, 1$$



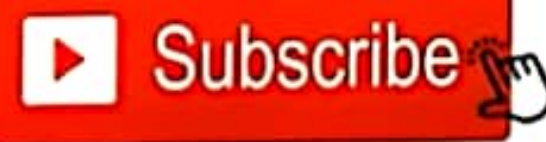
$$2\exp\left[i\left(-\frac{\pi}{6} + \frac{2k\pi}{3}\right)\right], k = 0, 1, 2$$

(Pg.194)





MTH632: Quiz 1



Question # 4 of 5

SOLVED BY: **WAQAR HUSSAIN**

A set S is said to be _____ set if for every pair of points at $z_1, z_2 \in S$ there is a curve C joining them which is entirely contained in S .

Select the correct option

PRESENTED BY: **TALEEMI MARKAZ**



bounded



unbounded



connected

(Pg.288)



unconnected





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Question # 5 of 5

SOLVED BY: **WAQAR HUSSAIN**

The function $u(x, y) = \frac{xy}{x^2 + y^2}$ does not have a limit when _____

Select the correct option

PRESENTED BY: **TALEEMI MARKAZ**



$(x, y) \rightarrow (1, 1)$



$(x, y) \rightarrow (0, 0)$

(Pg.574)



$(x, y) \rightarrow (0, 1)$



$(x, y) \rightarrow (1, 0)$

