


Question Review

All 



The least difference of amplitude between two fifth roots of unity is:

- ☒ 72°
- ☐ 108°
- ☐ 54°
- ☐ none of these

EXPLANATIONS

[Report](#) 

34 % were correct!

We know,

$$1 = e^{i \times 0} = e^{i \times 360^\circ}$$

So the fifth root with least acute amplitude is:

$$e^{i \times 360 / 5} = e^{i \times 72^\circ}$$

Hence, the angle is 72°

*The  $n^{th}$  roots of unity represet vertices of  $n$  sided regular polygon in Argand plane.*



If  $|z - 4| < |z - 2|$ , its solution is given by

- ☐  $\text{Re}(z) > 0$
- ☐  $\text{Re}(z) < 0$
- ☒  $\text{Re}(z) > 3$
- ☐  $\text{Re}(z) > 2$

EXPLANATIONS

[Report](#) 

47 % were correct!

Given  $|z - 4| < |z - 2|$  Let  $z = x + iy$   
 $\Rightarrow |(x - 4) + iy| < |(x - 2) + iy|$   
 $\Rightarrow (x - 4)^2 + y^2 < (x - 2)^2 + y^2$   
 $\Rightarrow x^2 - 8x + 16 < x^2 - 4x + 4 \Rightarrow 12 < 4x$   
 $\Rightarrow x > 3 \Rightarrow \text{Re}(z) > 3$



If  $\tan 2\theta \tan \theta = 1$  , then the general value of  $\theta$  is



- ☐  $(2n + 1) \frac{\pi}{6}$
- ☐  $(n + \frac{1}{2}) \pi$
- ☐  $(4n \pm 1) \frac{\pi}{6}$
- ☒  $(6n \pm 1) \frac{\pi}{6}$

EXPLANATIONS

Report

38 % were correct!

$$\tan(x) \frac{2 \tan(x)}{1 - \tan^2(x)} = 1$$
$$\Rightarrow 3 \tan^2(x) = 1$$
$$\Rightarrow 3 \tan^2(x) = 1$$
$$\tan(x) = \pm \sqrt{\frac{1}{3}}$$
$$x = (6n \pm 1) \frac{\pi}{6}$$
$$x = (6n \pm 1) \frac{\pi}{6}$$

- If  $\vec{a} \times \vec{b} = \vec{c}$  and  $\vec{b} \times \vec{c} = \vec{a}$ , then:
- ☒  $\vec{a}, \vec{b}$  and  $\vec{c}$  are mutually perpendicular but may be of different magnitudes
- ☐  $\vec{a}, \vec{b}$  and  $\vec{c}$  are not mutually perpendicular and may be of different magnitudes
- ☐  $\vec{a}, \vec{b}$  and  $\vec{c}$  are mutually perpendicular and are of same magnitude
- ☐  $\vec{a}, \vec{b}$  and  $\vec{c}$  are not mutually perpendicular but are of same magnitudes

EXPLANATIONS

Report

41 % were correct!

$\vec{a} \times \vec{b} = \vec{c}$  implies,  $\vec{c}$  is perpendicular to both  $\vec{a}$  and  $\vec{b}$ .

$\vec{b} \times \vec{c} = \vec{a}$  implies,  $\vec{a}$  is perpendicular to both  $\vec{b}$  and  $\vec{c}$ .

So, the three vectors are mutually perpendicular to each other.

$\vec{a} \times \vec{b} = \vec{c}$   
Or,  $|\vec{a} \times \vec{b}| = c$   
Or,  $ab \sin(\pi/2) = c$   
Or,  $c = ab$

Similarly we can deduce,  $a = bc$

Substituting  $a, c = b^2c \implies b = 1$

Substituting  $b = 1, a = c$  but not necessarily 1.

So, (a) is correct.

The domian of definition of the funciton  $f(x) = \sin^{-1}\left(\frac{1}{\sqrt{1-x^2}}\right)$  is:

☐ [-1,1]

☐ (-1,1)

☒ {0}

☐  $\mathbb{R} - [-1,1]$

EXPLANATIONS

[Report](#) 

28 % were correct!

For the function to be defined (to take real values), the expression under the root sign should be non-negative.

So,  $1 - x^2 \geq 0 \implies -1 < x < 1$

But for the non zero values of such  $x$ ,  $\sqrt{1 - x^2} < 1$ ,

and hence,  $\frac{1}{\sqrt{1 - x^2}} > 1$

This makes the function undefined as  $\sin^{-1} x$  is not defined when  $x > 1$ .

So, the only value of  $x$  to define the function is  $x = 0$ , and hence the domain is  $\{0\}$

OR

Take  $x = 1/2$ , the function is not defined, which eliminates (a),(b).

Now, take  $x = 2$ , this eliminates option(d).

So, (c) is correct.

If  $-1 + \sqrt{-3} = re^{i\theta}$  then  $\theta$  is

☐  $\frac{\pi}{3}$

☐  $-\frac{\pi}{3}$

☒  $\frac{2\pi}{3}$

☐  $-\frac{2\pi}{3}$



EXPLANATIONS

Report !

55 % were correct!

$\theta$  is amplitude of  $-1 + i\sqrt{3}$ , which is given by:

$\tan \theta = -\sqrt{3}$  Or,  $\theta = \frac{2\pi}{3}$

The equation of the circle passing through the point  $(-1, -3)$  and touching the line  $4x + 3y - 12 = 0$  at the point  $(3, 0)$ , is

☒  $x^2 + y^2 - 2x + 3y - 3 = 0$

☐  $x^2 + y^2 + 2x - 3y - 5 = 0$

☐  $2x^2 + 2y^2 - 2x + 5y - 8 = 0$

☐ none of these

EXPLANATIONS

Report !

59 % were correct!

Let the equation be:

$x^2 + y^2 + 2gx + 2fy + c = 0 \dots (i)$

But it passes through  $(-1, -3)$  and  $(3, 0)$ . Therefore,

$10 - 2g - 6f + c = 0 \dots (ii)$

$9 + 6g + c = 0 \dots (iii)$

Also center is  $C(-g, -f)$

Slope of tangents  $= -\frac{4}{3} \Rightarrow$  Slope of normal  $= \frac{3}{4}$

$\Rightarrow \frac{f}{3 + g} = \frac{3}{4} \Rightarrow 3g - 4f + 9 = 0 \dots (iv)$

Solving (ii), (iii) and (iv),

$g = -1, f = \frac{3}{2}$  and  $c = -3$

So, the equation is:  $x^2 + y^2 - 2x + 3y - 3 = 0$

[The points  $(-1, -3)$  and  $(3, 0)$  must satisfy the equation of circle. Circle given in (a) satisfies both the points. Also check whether it touches the line  $4x + 3y - 12 = 0$  or not ]

If  $z$  is a purely imaginary number then,  $\left| \frac{z - 1}{z + 1} \right| =$

☒ 1

☐ 0

- ☐ |z|
- ☐ none of these

EXPLANATIONS

Report !

53 % were correct!

Let  $z = ai$

Then,

$$\begin{aligned}\left|\frac{z-1}{z+1}\right| &= \left|\frac{ai-1}{ai+1}\right| \\ &= \frac{|ai-1|}{|ai+1|} \\ &= \frac{\sqrt{1+a^2}}{\sqrt{1+a^2}} \\ &= 1\end{aligned}$$

Volume of  $\frac{N}{10}H_2SO_4$  required to neutralize 10 ml 5 N  $Na_2CO_3$  is

☐ 100 ml

☐ 50 ml

☒ 500 ml

☐ 1000 ml

EXPLANATIONS

Report !

85 % were correct!

$N_1 V_1 = N_2 V_2$

$$\Rightarrow 5 \times 10 = \frac{1}{10x} \times x \therefore x = 500ml$$

The oxidation number of carbon in  $CH_2O$  is

☐ -2

☐ +2

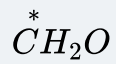
☒ 0

☐ +4

EXPLANATIONS

Report !

70 % were correct!



$$x + 2 - 2 = 0$$

$$x = 0.$$

The total number of gm-molecules of  $SO_2Cl_2$  in 13.5g of sulphuryl chloride is

☒ 0.1

☐ 0.2

☐ 0.3

☐ 0.4

## EXPLANATIONS

[Report](#) 

56 % were correct!

Molecular weight of  $SO_2Cl_2 = 32 + 32 + 2 \times 35.5 = 135 \text{ gm}$

$\therefore 135 \text{ gm}$  of  $SO_2Cl_2 = 1 \text{ gm}$  molecule

$\therefore 13.5 \text{ gm}$  of  $SO_2Cl_2 = \frac{1}{135} \times 13.5 = 0.1$ .

The charge on cobalt in  $[Co(CN)_6]^{3-}$  is

☐ -6

☐ -3

☒ +3

☐ +6

## EXPLANATIONS

[Report](#) 

61 % were correct!

In  $[Co(CN)_6]^{3-}$  complex Co shows +3 oxidation state.

Which of the following alkanes contains primary, secondary, tertiary and quaternary carbon atoms together ?

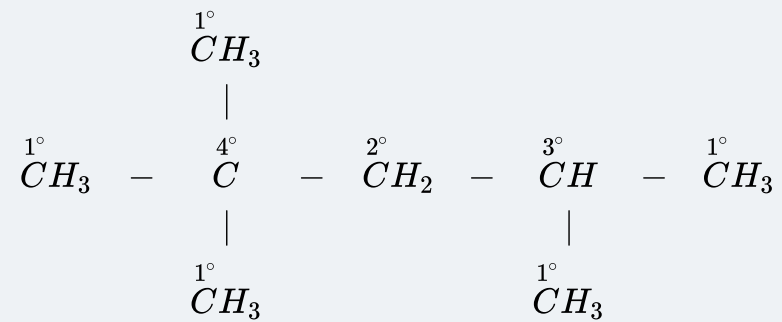
☐  $(CH_3)_3CH$

☐  $(C_2H_5)_3CH$ 
☒  $(CH_3)_3C - CH_2 - CH(CH_3)_2$ 
☐  $(CH_3)_4C$ 

## EXPLANATIONS

[Report](#) 

64 % were correct!



NOTE:

1° – primary

2° – secondary

3° – tertiary

4° – quaternary

How many grams of  $NaOH$  will be required to prepare 250  $ml$  of 0.1  $M$  solution ?

☒ 1 gm

☐ 4 gms

☐ 40 gms

☐ 10 gms

## EXPLANATIONS

[Report](#) 

76 % were correct!

$$\text{Molarity} = \frac{wt. \times 1000}{\text{Eq. wt.} \times \text{vol.}}$$

$$0.1 = \frac{wt. \times 1000}{40 \times 250}$$

 $\therefore$  wt. required = 1 gm

The  $pH$  value of  $1.0 \times 10^{-8} M HCl$  solution is less than 8 because

☐ HCl is completely ionised at this concentration

☐ The ionization of water is negligible

- ☒ The ionization of water cannot be assumed to be negligible in comparison with this low concentration of HCl
- ☐ The  $pH$  cannot be calculated at such a low concentration of HCl

EXPLANATIONS

Report 

73 % were correct!

As the solution is acidic,  $pH < 7$ . This is because  $[H^+]$  from  $H_2O$  cannot be neglected in comparison to  $10^{-8}$

What is the minimum concentration of  $SO_4^{2-}$  required to precipitate  $BaSO_4$  in a solution containing  $1.0 \times 10^{-4}mol\ Ba^{2+}$  ? (  $K_{sp}$  for  $BaSO_4$  is  $4 \times 10^{-10}$  )

- ☐  $4 \times 10^{-10}M$
- ☐  $2 \times 10^{-4}M$
- ☒  $4 \times 10^{-6}M$
- ☐  $2 \times 10^{-3}M$

EXPLANATIONS

Report 

57 % were correct!

$BaSO_4 \rightleftharpoons Ba^{2+} + SO_4^{2-}$

$$K_{sp} = [Ba^{2+}] \times [SO_4^{2-}]$$
$$4 \times 10^{-10} = [1 \times 10^{-4}] \times [SO_4^{2-}]$$
$$[SO_4^{2-}] = \frac{4 \times 10^{-10}}{1 \times 10^{-4}} = 4 \times 10^{-6}.$$

They speak ----- about us.

- ☐ bitter
- ☒ bitterly
- ☐ bitterness
- ☐ none

If the train is late, we ----- .



☒ will walk

☐ would walk

☐ had walk

☐ walk

EXPLANATIONS

[Report](#) 

69 % were correct!

The given sentence is first conditional type and the expected main clause should be on simple future tense.

Therefore, the correct sentence is,

If the train is late, we will walk.

I ..... my childhood in Pokhara.

☐ spend

☐ am spending

☒ spent

☐ was spending

EXPLANATIONS

[Report](#) 

73 % were correct!

We use simple past tense while talking about the past, normally.

By the end of the year, she \_\_\_ with a degree in business.

☐ already graduates

☒ will have already been graduated

☐ has already graduated

☐ will be graduated

EXPLANATIONS

[Report](#) 

61 % were correct!

Future perfect tense indicates an action that will be completed by a particular point in time.

