


Question Review

All 



$$\begin{vmatrix} 1 & a & a^2 \\ 1 & b & b^2 \\ 1 & c & c^2 \end{vmatrix} =$$

☐ $a^2 + b^2 + c^2$

☐ $(a + b)(b + c)(c + a)$

☒ $(a - b)(b - c)(c - a)$

☐ none of these

EXPLANATIONS

[Report](#) 

76 % were correct!

Try putting $a = 1, b = 2$ and $c = 3$

The determinant becomes:

$$\begin{vmatrix} 1 & 1 & 1 \\ 1 & 2 & 4 \\ 1 & 3 & 9 \end{vmatrix} = \begin{vmatrix} 1 & 1 & 1 \\ 0 & 1 & 3 \\ 0 & 2 & 8 \end{vmatrix}$$

$$[R_2 \rightarrow R_2 - R_1, R_3 \rightarrow R_3 - R_1]$$

$$8 - 6 = 2$$

Checking options, only (c) satisfies.



$$\frac{d}{dx} \tan^{-1} \frac{x}{\sqrt{a^2 - x^2}} =$$

☐ $\frac{a}{a^2 + x^2}$

☐ $\frac{-a}{a^2 + x^2}$

☐ $\frac{1}{a\sqrt{a^2 - x^2}}$

☒ $\frac{1}{\sqrt{a^2 - x^2}}$

EXPLANATIONS

[Report](#) 

38 % were correct!

$$\frac{d}{dx} \tan^{-1} \frac{x}{\sqrt{a^2 - x^2}}$$

Putting $x = a \sin \theta$, we get

$$= \frac{d}{dx} \left[\tan^{-1} \frac{a \sin \theta}{a \cos \theta} \right] = \frac{d}{dx} [\tan^{-1} \tan \theta] = \frac{d}{dx} [\theta]$$

Substituting value of θ , so $\frac{d}{dx} \left[\sin^{-1} \left(\frac{x}{a} \right) \right] = \frac{1}{\sqrt{a^2 - x^2}}$

In the expansion of $(x^2 - 2x)^{10}$, the coefficient of x^{16} is

☐ -1680

☐ 1680

☒ 3360

☐ 6720

EXPLANATIONS

Report !

67 % were correct!

The coefficient of x^{16} in the expansion of $(x^2 - 2x)^{10}$ = The coefficient of x^{16} in $x^{10}(x - 2)^{10}$ = The coefficient of x^6 in $(x - 2)^{10}$

$$= {}^{10}C_4 \cdot 2^4, \quad (\because T_{r+1} = {}^nC_r x^{n-r} a^r)$$
$$= 210 \times 16 = 3360.$$

If the 4^{th} , 7^{th} and 10^{th} terms of a G.P. be a , b , c respectively, then the relation between a , b , c is:

☐ $b = \frac{a+c}{2}$

☐ $a^2 = bc$

☒ $b^2 = ac$

☐ $a^2 = ab$

EXPLANATIONS

Report !

78 % were correct!

Let first term of G.P. = A and common ratio = r

We know that n^{th} term of G.P. = Ar^{n-1}

Now $t_4 = a = Ar^3$, $t_7 = b = Ar^6$ and $t_{10} = c = Ar^9$

Relation $b^2 = ac$ is true because $b^2 = (Ar^6)^2 = A^2r^{12}$ and $ac = (Ar^3)(Ar^9) = A^2r^{12}$

[NOTE: if a, b, c are in AP, then x^a, x^b, x^c are in GP]



Domain of definition of the function $y = \frac{\sqrt{x^2 - x + 2}}{\sqrt{x^2 - x - 2}}$ is:

☐ $(-1, 2)$

☒ $\mathbb{R} - [-1, 2]$

☐ $\mathbb{R} - (-1, 2)$

☐ none of these

EXPLANATIONS

[Report](#)

68 % were correct!

Given function is:

$$f(x) = \sqrt{\frac{x^2 - x + 2}{x^2 - x - 2}}$$

The quadratic of numerator is $x^2 - x + 2$ whose discriminant is $1 - 8 = -7$. So, it is always positive. (the constant 1 is positive)

The quadratic in denominator is $x^2 - x - 2$ whose discriminant is $1 + 8 = 9$.

The roots are $\frac{1}{2} \pm \frac{3}{2} = 2, -1$

Since the constant is negative and $0 \in (-1, 2)$, the quadratic is negative in the interval $(-1, 2)$.

So, the domain is $\mathbb{R} - [-1, 2]$.

[The quadratic in denominator can't be zero]



The middle term of $\left(x - \frac{1}{x}\right)^5$ is:

☐ 0

☐ $10x$

☐ $-10/x$

☒ none of these

EXPLANATIONS

[Report](#)

26 % were correct!

The general term is:

$$t_n = (-1)^n {}^5C_n x^n (1/x)^{5-n}$$

For middle term, $n = 3$,

$$t_3 = -10x$$

So, the answer is (d).



The area between the curves $y = x^2$ and $y = 2 - x^2$ is:

☐ 4/3

☒ 8/3

☐ 4

☐ none of these

EXPLANATIONS

[Report](#)

60 % were correct!

The intersection of the curves is found as $x^2 = 2 - x^2 \Rightarrow x^2 = 1 \Rightarrow x = \pm 1$

Also, for $-1 \leq x \leq 1$, both x^2 and $2 - x^2$ are positive.

Thus, the area is:

$$\begin{aligned} A &= \int_{-1}^1 (2 - x^2 - x^2) dx \\ &= 2 \int_{-1}^1 (1 - x^2) dx \\ &= 2 \times \left[x - \frac{x^3}{3} \right]_{-1}^1 = 8/3 \end{aligned}$$



If $y = e^{x+e^{x+e^{x+\dots\infty}}}$, then $\frac{dy}{dx} =$

☒ $\frac{y}{1-y}$

☐ $\frac{1}{1-y}$

☐ $\frac{y}{1+y}$

☐ $\frac{y}{y-1}$

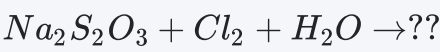
EXPLANATIONS

[Report](#)

60 % were correct!

$$y = e^{x+y} \Rightarrow \log y = (x + y) \log e$$

$$\Rightarrow \frac{1}{y} \frac{dy}{dx} = 1 + \frac{dy}{dx} \Rightarrow \frac{dy}{dx} = \frac{y}{1-y}$$



☐ S + HCl + Na₂S

☐ S + HCl + Na₂SO₃

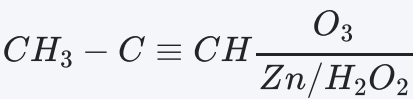
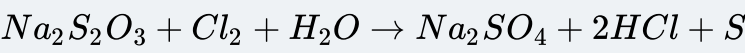
☒ S + HCl + Na₂SO₄

☐ S + NaClO₃ + H₂O

EXPLANATIONS

[Report](#)

35 % were correct!



> *Product*

Product formed in above reaction is

☐ CH₃COOH

☐ HCOOH

☒ Both (a) and (b)

☐ CH₃CHO + HCHO

EXPLANATIONS

[Report](#)

35 % were correct!

Carboxylic acids are formed from ozonolysis of Alkynes



Automobile engine blocks are made of

☐ stainless steel

☒ cast iron

☐ nickel-chromium steel

☐ wrought iron

EXPLANATIONS

[Report](#)

Automobile engine blocks are made of cast iron.

IUPAC name of $CHO - (CH_2)_4 - COOH$ is

☐ Heaxan-1-al-6-oic acid

☒ Formyl-hexanoic acid

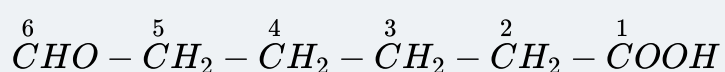
☐ Hexanal-1-carboxylic acid

☐ Hexanoic acid 5-al-1

EXPLANATIONS

[Report](#) 

44 % were correct!



Carboxy group has higher order of preference than formyl group. Since there is only one -CHO group it gets the smallest possible number (length of parent chain). So it is not necessary to indicate its position.

So Formyl-hexanoic acid

0.16 gm of a dibasic acid required 25 ml of decinormal $NaOH$ solution for complete neutralization. The molecular weight of the acid is

☐ 32

☐ 64

☒ 128

☐ 256

EXPLANATIONS

[Report](#) 

65 % were correct!

$$\text{Strength of acid} = \frac{0.16}{0.025} = 6.4g/l = \frac{6.4}{E} N$$

$$N_1 \times V_1 = N_2 \times V_2$$

$$\frac{6.4}{E} \times 25 = 0.1 \times 25$$

$$E = 64$$

Since the acid is dibasic , Mol Wt. = $64 \times 2 = 128$

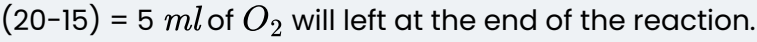
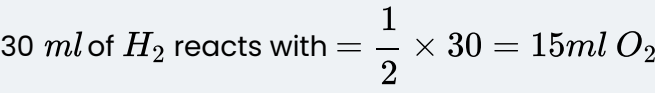
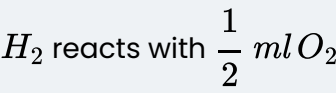
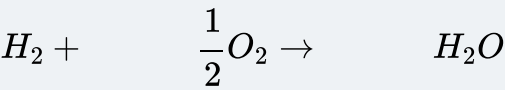
If 30 ml of H_2 and 20 ml of O_2 reacts to form water, what is left at the end of the reaction

- ☐ 10 ml of H₂
- ☐ 5 ml of H₂
- ☐ 10 ml of O₂
- ☒ 5 ml of O₂

EXPLANATIONS

Report

53 % were correct!



In the reaction: $H_2S \rightleftharpoons 2H^+ + S^{2-}$, when NH_4OH is added, then

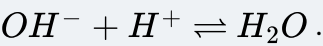
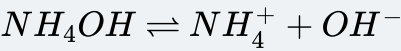
- ☐ S⁻ is precipitate
- ☐ No action takes places
- ☐ Concentration of S⁻ decreases
- ☒ Concentration of S⁻ increases

EXPLANATIONS

Report

30 % were correct!

In IVth group the S^{2-} concentration increase when added the NH_4OH because



So that dissociation of H_2S is favoured, thus S^{2-} is increased.

Which of the following compound is formed when a gas obtained by reacting H_2SO_4 with excess of P_4O_{10} is treated with anhydrous HCl ?

☒ Chlorosulphonic acid

☐ Hypochlorous acid

☐ Sulphur

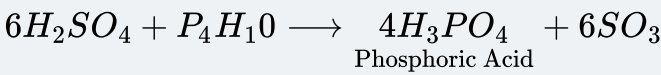
☐ Phosphine

EXPLANATIONS

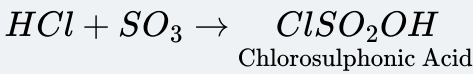
[Report](#)

28 % were correct!

H_2SO_4 reacts with the P_4O_{10} to give phosphoric acid and sulphur trioxide gas. The reaction occurs as :



The SO_3 formed is a gas and can react with HCl.



Chlorosulphonic acid is used for many purposes including the synthesis of detergents, pharmaceuticals, dyes, ion exchange resins, etc.



Shankaran Pillai was born ___ a Saturday.

☐ in

☐ at

☒ on

☐ All of above

EXPLANATIONS

[Report](#)

79 % were correct!

'on' is used before days of week.



Yesterday was not a nice day. It ___ since morning.

☐ was raining

☐ has been raining

☒ had been raining

☐ rained

EXPLANATIONS

[Report](#)

38 % were correct!

Because of the time adverb 'yesterday', the act of raining was in the past, and it continued over a period of time.
For an ongoing action that occurred in the past and continued for a period of time, we use past perfect continuous tense.

Choose the correct sentence:

- ☒ My favorite musician, who is also my sister, plays a mean fuzz bass.
- ☐ My favorite musician who is also my sister plays a mean fuzz bass.
- ☐ My favorite musician who is also my sister, plays a mean fuzz bass.
- ☐ My favorite musician, who is also my sister plays a mean fuzz bass.

EXPLANATIONS

[Report](#) 

45 % were correct!

The non-essential clause 'who is also my sister' should be surrounded by commas.

I have _____ hour and _____ half to do this job.

- ☐ an, the
- ☐ a, an
- ☐ the, the
- ☒ an, a

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