


Question Review

All 



If $|x| > 1$, then $(1 + x)^{-2} =$

☐ $1 - 2x + 3x^2 \dots$

☐ $1 + 2x + 3x^2 + \dots$

☐ $1 - \frac{2}{x} + \frac{3}{x^2} \dots$

☒ $\frac{1}{x^2} - \frac{2}{x^3} + \frac{3}{x^4} - \dots$

EXPLANATIONS

[Report](#) 

19 % were correct!

Given that $|x| > 1$.

So given expression can be written as:

$$\begin{aligned} x^{-2} \left(1 + \frac{1}{x} \right)^{-2} &= x^{-2} \left[1 - \frac{2}{x} + \frac{3}{x^2} - \frac{4}{x^3} + \dots \right] \\ &= \left[\frac{1}{x^2} - \frac{2}{x^3} + \frac{3}{x^4} - \frac{4}{x^5} + \dots \right] \end{aligned}$$



If $S_n = \ln x + \ln 2x + \ln 3x + \dots + \ln nx$ and $m > n$, then, $x \frac{d}{dx} (S_m - S_n) =$

☒ $m - n$

☐ $m + n$

☐ mn

☐ $\frac{m}{n}$

EXPLANATIONS

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35 % were correct!

Note that $\frac{d}{dx} \ln(nx) = \frac{1}{nx} \times n = \frac{1}{x}$

So,



$$\begin{aligned}\frac{d}{dx}(S_m - S_n) &= \frac{d}{dx}S_m - \frac{d}{dx}S_n \\ &= \frac{m}{x} - \frac{n}{x} \\ &= \frac{1}{x}(m - n)\end{aligned}$$

Hence, $x \frac{d}{dx}(S_m - S_n) = m - n$

$$\lim_{x \rightarrow \pi/4} \frac{\sqrt{2} \cos x - 1}{\cot x - 1} =$$

☐ $\frac{1}{\sqrt{2}}$

☒ $\frac{1}{2}$

☐ $\frac{1}{2\sqrt{2}}$

☐ 1

EXPLANATIONS

Report 

77 % were correct!

$$\begin{aligned}\lim_{x \rightarrow \pi/4} \frac{(\sqrt{2} - \sec x) \cos x (1 + \cot x)}{\cot x [2 - \sec^2 x]} \\ = \lim_{x \rightarrow \pi/4} \frac{\sin x (1 + \cot x)}{(\sqrt{2} + \sec x)} = \frac{\frac{1}{\sqrt{2}}(2)}{\sqrt{2} + \sqrt{2}} = \frac{1}{2}\end{aligned}$$

Or

Using L-Hopital's Rule:

$$\lim_{x \rightarrow \pi/4} \frac{\sqrt{2} \cos x - 1}{\cot x - 1} = \lim_{x \rightarrow \pi/4} \frac{-\sqrt{2} \sin x}{-\operatorname{cosec}^2 x} = \frac{1}{2}$$

If $y = \cos \theta + i \sin \theta$ then $y + \frac{1}{y}$ is

☒ $2 \cos \theta$

☐ $2 \sin \theta$

☐ $2 \operatorname{cosec} \theta$

☐ $2\tan\theta$

EXPLANATIONS

[Report](#) 

68 % were correct!

$$y = \cos \theta + i \sin \theta = e^{i\theta}$$

Then $\frac{1}{y} = e^{-i\theta} = \cos \theta - i \sin \theta$

$$\therefore y + \frac{1}{y} = 2 \cos \theta$$

$$\lim_{n \rightarrow \infty} \frac{\sqrt{n}}{\sqrt{n} + \sqrt{n+1}} =$$

☐ 1

☒ 1/2

☐ 0

☐ ∞

EXPLANATIONS

[Report](#) 

67 % were correct!

$$\lim_{n \rightarrow \infty} \frac{1}{1 + \sqrt{1 + \frac{1}{n}}} = \frac{1}{2} \text{ (Dividing numerator and denominator by } \sqrt{n} \text{)}$$

The line perpendicular to the line $ax + by + c = 0$ which passes through (b, a) is :

☐ $ax + by = a^2 + b^2$

☒ $bx - ay = (b - a)(b + a)$

☐ $bx - ay = (a - b)(b + a)$

☐ $bx + ay = b^2 + a^2$

EXPLANATIONS

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64 % were correct!

The line perpendicular to $ax + by + c = 0$ is $bx - ay + k = 0$

Also, since it passes through (b, a) , $k = a^2 - b^2$

Hence, $bx - ay = (b - a)(b + a)$



The vertex of the parabola $3x - 2y^2 - 4y + 7 = 0$ is

☐ (3,1)

☒ (-3,-1)

☐ (-3,1)

☐ none of these

EXPLANATIONS

[Report](#)

64 % were correct!

Completing square, we can write the equation as $(y + 1)^2 = \frac{3}{2}(x + 3)$.

So, vertex is $(-3, -1)$.



The foci of the conic $25(x + 3)^2 + 16(y - 4)^2 = 400$ are:

☒ (-3,7) and (-3,1)

☐ (1,-3) and (7,-3)

☐ (0,4) and (-6,4)

☐ none of these

EXPLANATIONS

[Report](#)

55 % were correct!

Given equation can be written as:

$$\frac{(x + 3)^2}{4^2} + \frac{(y - 4)^2}{5^2} = 1$$

which is an ellipse with center $(-3, 4)$ and major axis parallel to Y axis as, $b = 5 > a = 4$.

$$\text{eccentricity } (e) = \sqrt{1 - \frac{a^2}{b^2}} = 3/5$$

So, the foci are:

$$(-3, 4 \pm be) = (-3, 7) \text{ and } (-3, 1)$$



0.32 gm of a metal on treatment with an acid gave 112 mL of hydrogen at STP. Calculate the equivalent weight of the metal

☐ 58



☒ 32

☐ 11.2

☐ 24

EXPLANATIONS

[Report](#) 

76 % were correct!

$$Eq. \text{ wt of metal} = \frac{\text{wt of metal} \times 11200}{\text{vol.of } H_2 \text{ in ml displaced at } STP}$$

IUPAC name of compound $CH_3 - CH_2 - CH(CH_3) - CH_2 - COCl$ is

☒ 3-methyl pentanoyl chloride

☐ 3-methyl butanoyl chloride

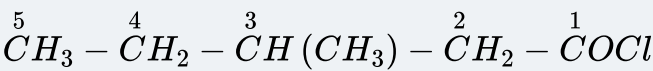
☐ 1-chloro-3-methyl pentanol

☐ None of these

EXPLANATIONS

[Report](#) 

62 % were correct!



3-methyl pentanoyl chloride

The addition of HCl will not suppress the ionization of

☐ Acetic acid

☐ Benzoic acid

☐ H_2S

☒ Sulphuric acid

EXPLANATIONS

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40 % were correct!

Common ion effect is noticed only for weak electrolyte dissociation. H_2SO_4 is strong electrolyte.





A Bessemer converter is used in the manufacture of

☒ Steel

☐ Cast iron

☐ Pig iron

☐ Silver

EXPLANATIONS

[Report](#)

61 % were correct!

Bessemer converter is used for the manufacture of steel from pig iron.



What thickness of the copper plating would you expect on a spherical ball of radius 1cm completely dipped in electrolyte on passing 5A current for one hour ?
[$\rho_{Cu} = 8.96\text{g/cm}^3$, $Mol. Wt. Cu = 63.5$]

☒ 0.05cm

☐ 0.25cm

☐ 1.55cm

☐ None of these

EXPLANATIONS

[Report](#)

37 % were correct!

From Faraday's Law of Electrolysis, we have ;

$$W = ZIt$$

$$\text{Or, } V \times \rho = Z \times I \times t$$

$$\text{Or, thickness} \times A \times \rho = \frac{E}{F} \times I \times t$$

$$\text{Or, thickness} = \frac{E \times I \times t}{F \times A \times \rho}$$

$$\text{Or, thickness} = \frac{31.75 \times 5 \times 60 \times 60}{96500 \times 4\pi \times (1)^2 \times 8.96}$$

$$\therefore \text{thickness} = 0.0525\text{cm}$$



Which of following is obtained when copper it treated with conc. HNO_3 ?

☐ N_2O_5



☒ NO₂

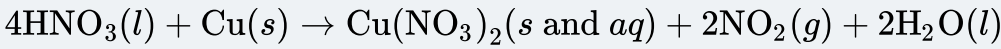
☐ NO

☐ N₂O

EXPLANATIONS

[Report](#) 

71 % were correct!



The solubility of BaSO₄ in water $2.42 \times 10^{-3} \text{g L}^{-1}$ at 298K . The value of its solubility product is

(Given molar mass of BaSO₄ = 233gmol⁻¹)

☐ $1.08 \times 10^{-14} \text{mol}^2 \text{L}^{-2}$

☐ $1.08 \times 10^{-12} \text{mol}^2 \text{L}^{-2}$

☒ $1.08 \times 10^{-10} \text{mol}^2 \text{L}^{-2}$

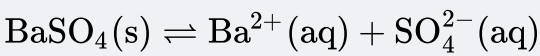
☐ $1.08 \times 10^{-8} \text{mol}^2 \text{L}^{-2}$

EXPLANATIONS

[Report](#) 

55 % were correct!

Solubility of BaSO₄, $S = \frac{2.42 \times 10^{-3}}{233} (\text{mol L}^{-1}) = 1.04 \times 10^{-5} (\text{mol L}^{-1})$



$$\begin{aligned} K_{sp} &= [\text{Ba}^{2+}] [\text{SO}_4^{2-}] = S \times S = S^2 \\ &= (1.04 \times 10^{-5})^2 \\ &= 1.08 \times 10^{-10} \text{mol}^2 \text{L}^{-2} \end{aligned}$$

When acetylene reacts with *HCl* in the presence of *HgCl*₂, the product is

☐ Methyl chloride

☐ Dichloroethane

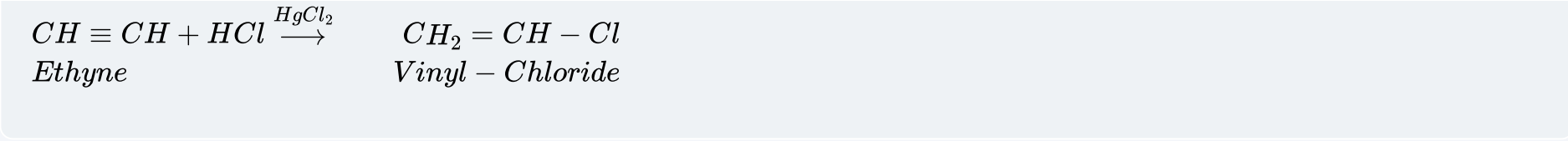
☒ Vinyl chloride

☐ Ethylidene chloride

EXPLANATIONS

[Report](#) 

52 % were correct!



Bhaktapur is famous ___ its JuJu-Dhau.

☐ in

☐ about

☐ to

☒ for

EXPLANATIONS Report !

93 % were correct!

'for' is used after 'famous'.

If you had been careful,_____.

☒ you wouldn't have cut your finger

☐ you wouldn't cut your finger

☐ you will not cut your finger

☐ you don't cut your finger

EXPLANATIONS Report !

87 % were correct!

The possible correct structure with if-clause: 'past perfect' is 'would have + past perfect'. This structure is used to describe unreal situations in the past.

The prefix non- goes with which word?

☐ talented

☐ regular

☒ injurious

☐ belief



Where_____?

☐ did you cut your hair

☐ have you cut your hair

☒ did you have your hair cut

☐ did you have cut your hair

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