

MHT CET 2026 Mathematics Answer Key PDF

Mathematics

- Option (b) $\frac{7\pi}{6}$
 Explanation: Substituting the principal values of each inverse function, we get $\tan^{-1}(\sqrt{3}) = \frac{\pi}{3}$, $\sec^{-1}(-2) = \frac{2\pi}{3}$, and $\sin^{-1}\left(-\frac{1}{2}\right) = -\frac{\pi}{6}$. Combining these values gives $\frac{\pi}{3} + \frac{2\pi}{3} - \left(-\frac{\pi}{6}\right) = \frac{7\pi}{6}$.
- Option (a) T, T, F, T
 Explanation: A conditional statement $(p \wedge q) \rightarrow (r \vee \neg s)$ is false only when the antecedent is true and the consequent is false. Thus, we must have $p \wedge q$ as True (so $p = T, q = T$) and $r \vee \neg s$ as False (so $r = F, s = T$).
- Option (a) 0
 Explanation: Since the relationship holds for any triangle, we can substitute the values of an equilateral triangle where $a = b = c$ and $A = 60^\circ$. Substituting this value into the expression gives $\frac{\cos 180^\circ}{\cos 60^\circ} + 2 = \frac{-1}{\frac{1}{2}} + 2 = 0$.
- Option (b) a^2
 Explanation: Expanding the expression yields $(b^2 + c^2)(\cos^2 \frac{A}{2} + \sin^2 \frac{A}{2}) - 2bc(\cos^2 \frac{A}{2} - \sin^2 \frac{A}{2})$, which simplifies to $b^2 + c^2 - 2bc \cos A$. By the Law of Cosines, this is equal to a^2 .
- Option (a) 13
 Explanation: Solving the separable differential equation $\frac{dy}{y+5} = dx$ gives $\log |y+5| = x+C$. Applying the initial condition $y(0) = 4$ yields $y(x) = 9e^x - 5$, so substituting $x = \log 2$ gives $y(\log 2) = 9(2) - 5 = 13$.
- Option (a) $\left(\frac{8}{49}, -\frac{12}{49}, -\frac{24}{49}\right)$
 Explanation: The coordinates of the foot of the perpendicular from the origin to the plane $ax+by+cz = d$ are $\left(\frac{ad}{a^2+b^2+c^2}, \frac{bd}{a^2+b^2+c^2}, \frac{cd}{a^2+b^2+c^2}\right)$. Substituting $a = 2, b = -3, c = -6$, and $d = 4$ yields the coordinates.
- Option (a) $\tan^{-1}\left(\frac{y}{x}\right) = \log \sqrt{x^2 + y^2} + C$
 Explanation: Substituting $y = vx$ into the homogeneous differential equation gives $v + x \frac{dv}{dx} = \frac{1+v}{1-v}$. Integrating the separated equation $\int \frac{1-v}{1+v^2} dv = \int \frac{dx}{x}$ and converting back to x and y yields the correct solution.

Chemistry

- Option (c) Acrylonitrile
 Explanation: Orlon, also known as polyacrylonitrile (PAN), is a synthetic polymer prepared by the addition polymerization of acrylonitrile ($CH_2 = CH - CN$) monomers under suitable conditions.
- Option (b) Hydrazone
 Explanation: The reaction of a ketone with hydrazine ($NH_2 - NH_2$) is a nucleophilic addition-elimination reaction. The elimination of a water molecule from the intermediate yields a hydrazone ($R_2C = N - NH_2$) as the final product.

10. Option (b) $AgCN$ (alc.)

Explanation: Alkyl halides react with silver cyanide ($AgCN$) because of its covalent nature, which makes the nitrogen atom the active nucleophile, leading to the formation of alkyl isocyanides (RNC).

11. Option (a) 0.1 M Glucose

Explanation: Glucose is a non-electrolyte and does not dissociate in solution ($i = 1$), resulting in the minimum number of solute particles. This leads to the least lowering of vapour pressure, giving it the maximum vapour pressure.

prepp
Your Personal Exam Guide