

### Single Correct Choice Type Questions

15. Ratio =  $\frac{\pi r^2}{4\pi r^2}$

Hence, the correct answer is (A).

16.  $y = \frac{b}{a}x + c$

Compare with  $y = mx + c$ , we get,  $m = \frac{b}{a}$ .

Hence, the correct answer is (B).

28.  $h = -\frac{b}{2a} = \frac{4}{2 \times 3} = \frac{2}{3}$

$$k = -\left(\frac{b^2 - 4ac}{4a}\right) = -\left(\frac{16 - 4 \times 1 \times 3}{4 \times 3}\right) = -\frac{1}{3}$$

Hence, the correct answer is (C).

31.  $180^\circ = \pi$  radian

Hence, the correct answer is (B).

49.  $\sin(n\pi) = 0, n = 0, 1, 2, \dots$

Hence, the correct answer is (C).

50.  $\cos(180 - \theta) = -\cos\theta$

Hence, the correct answer is (A).

89.  $\frac{dy}{dx} = \frac{1}{2}(2x^2 + 1)^{\frac{1}{2}-1} \times \frac{d}{dx}(2x^2 + 1)$

$$\Rightarrow \frac{dy}{dx} = \frac{4x}{2\sqrt{2x^2 + 1}} = \frac{2x}{\sqrt{2x^2 + 1}}$$

Hence, the correct answer is (B).

90.  $\frac{dy}{dx} = e^{\sqrt{2x}} \times \frac{d}{dx}(\sqrt{2x}) = \frac{2e^{\sqrt{2x}}}{2\sqrt{2x}} = \frac{e^{\sqrt{2x}}}{\sqrt{2x}}$

Hence, the correct answer is (A).

96.  $y = 3\sin^2 x \cos x - 6\sec x \sec x \tan x$

$$\Rightarrow y = 3\left(\frac{\sqrt{3}}{2}\right)^2 \times \frac{1}{2} - 6 \times 2 \times 2 \times \sqrt{3}$$

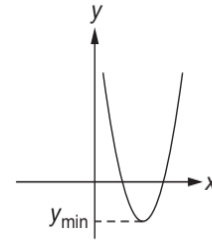
$$\Rightarrow y = \frac{9}{4} - 24\sqrt{3} = \frac{9 - 96\sqrt{3}}{4}$$

Hence, the correct answer is (A).

97.  $\frac{dy}{dx} = \frac{d\sin(2x^2)}{d(2x^2)} \times \frac{d(2x^2)}{dx} = \cos(2x^2) \times 4x$

Hence, the correct answer is (A).

98.  $y = 2x^2 - x + 1$



$$\Rightarrow h = -\left(-\frac{1}{4}\right) = \frac{1}{4}$$

$$\Rightarrow k = -\left(\frac{1 - 4 \times 2}{4 \times 8}\right) = -\frac{7}{8}$$

Hence, the correct answer is (C).

99.  $\frac{dy}{dx} = 2\sin x \cos x - 4\tan x \sec^2 x$

$$\Rightarrow \frac{dy}{dx} = 2 \times \frac{1}{\sqrt{2}} \times \frac{1}{\sqrt{2}} - 4 \times T \times 2 \times 2$$

$$\Rightarrow \frac{dy}{dx} = 1 - 16 = -15$$

Hence, the correct answer is (D).

100.  $\frac{dy}{dx} = 3x^2 + 2$

at  $x = 1$

$$\Rightarrow \left(\frac{dy}{dx}\right)_{x=1} = 3$$

Hence, the correct answer is (D).

101.  $y = \frac{1+x}{e^x}$

$$\Rightarrow \frac{dy}{dx} = \frac{d}{dx}\left(\frac{1+x}{e^x}\right)$$

$$\Rightarrow \frac{dy}{dx} = \frac{e^x \left[ \frac{d}{dx}(1+x) \right] - (1+x) \frac{d}{dx}(e^x)}{e^{2x}}$$

$$\Rightarrow \frac{dy}{dx} = \frac{e^x - (1+x)e^x}{e^{2x}} = -\frac{x}{e^x}$$

Hence, the correct answer is (B).

103.  $\frac{dy}{dx} = 3x^2 + 2$

Hence, the correct answer is (D).

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$$104. \frac{dy}{dx} = \frac{e^x - (1+x)e^x}{e^x e^x} = \frac{-x}{e^x}$$

Hence, the correct answer is (B).

$$114. \int_0^1 (3x^2 - 4x + 1) dx = \left( 3 \frac{x^3}{3} - \frac{4x^2}{2} + x \right) \Big|_0^1 = 1 - \frac{4}{2} + 1 = 0$$

Hence, the correct answer is (A).

$$115. \text{ Let, } I = \int_0^{\pi/2} \sin(2\theta) d\theta = \left( \frac{-\cos(2\theta)}{2} \right) \Big|_0^{\pi/2}$$

$$\Rightarrow I = - \left( \frac{\cos \pi - \cos 0}{2} \right) = - \left[ \frac{-1 - 1}{2} \right] = 1$$

Hence, the correct answer is (B).

$$116. \int_3^5 \frac{1}{2x+3} dx = \left( \frac{\ln(2x+3)}{2} \right) \Big|_3^5 = \frac{\ln(13) - \ln 9}{2} = \frac{1}{2} \ln \left( \frac{13}{9} \right)$$

Hence, the correct answer is (B).

$$117. \int_0^1 (3-2x)^{-2} dx = \left( \frac{(3-2x)^{-2+1}}{(-2+1) \times 3} \right) \Big|_0^1 = -\frac{1}{3} \left( 1 - \frac{1}{3} \right) = -\frac{2}{9}$$

Hence, the correct answer is (B).

$$118. \text{ Let, } I = \int \sqrt{1 + \cos x} dx = \int \left( \sqrt{1 + 2 \cos \frac{x}{2} - 1} \right) dx$$

$$\Rightarrow I = \int \sqrt{2} \cos \frac{x}{2} dx$$

$$\Rightarrow I = \sqrt{2} \frac{\sin \left( \frac{x}{2} \right)}{\left( \frac{1}{2} \right)} + C$$

$$\Rightarrow I = 2\sqrt{2} \sin \left( \frac{x}{2} \right) + C$$

Hence, the correct answer is (C).

$$119. \int_0^2 2t dt = (t^2) \Big|_0^2 = 4$$

Hence, the correct answer is (B).

$$120. \text{ Let } I = \int_{\pi/6}^{\pi/2} \sin x dx = \left( -\cos x \right) \Big|_{\pi/6}^{\pi/2}$$

$$\Rightarrow I = \left[ -\cos \left( \frac{\pi}{2} \right) \right] - \left[ -\cos \left( \frac{\pi}{6} \right) \right]$$

$$\Rightarrow I = 0 + \frac{\sqrt{3}}{2}$$

Hence, the correct answer is (C).

$$121. \int \frac{dt}{(6t-1)} = \frac{1}{6} \log(6t-1) + C$$

Hence, the correct answer is (A).

$$122. \int (4 \cos t + t^2) dt = \int 4 \cos t dt + \int t^2 dt = 4 \sin t + \frac{t^3}{3} + C$$

Hence, the correct answer is (C).