

KNOWLEDGE HORIZON CLASSES

Test Series

Q1. A relation on a set $A = \{1, 2, 3\}$ is $R = \{(1, 1), (2, 2), (3, 3)\}$ is
 (i) Only function
 (ii) Not a function
 (iii) Bijective function
 (iv) Only one one function

Q2. If $f: \mathbb{Q} \rightarrow \mathbb{Q}$ is defined by $f(x) = x^2$, then find $f^{-1}(9)$.
 (i) 3 (ii) -3
 (iii) ± 3 (iv) 9

Q3. The range of $\cot^{-1} x$ is
 (i) $[0, \pi]$ (ii) $(0, \pi)$ (iii) $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$ (iv) $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$

Q4. $\tan^{-1} \frac{1}{\sqrt{x^2 - 1}} =$
 (i) $-\sec^{-1} x$ (ii) $\sec^{-1} x$
 (iii) $\frac{\pi}{2} - \sec^{-1} x$ (iv) None of these

Q5. If $\begin{bmatrix} x+y & 3x-2y \\ 5x-z & 2y-1 \end{bmatrix} = \begin{bmatrix} 3 & -1 \\ 2 & 3 \end{bmatrix}$ Find x, y and z
 (i) $x = 0, y = 1, z = 2$ (ii) $x = 1, y = 1, z = 2$
 (iii) $x = 1, y = 2, z = 2$ (iv) $x = 1, y = 2, z = 3$

Q6. $\begin{vmatrix} 9 & 9 & 12 \\ 1 & 3 & -4 \\ 1 & 9 & 12 \end{vmatrix} =$
 (i) 566
 (ii) 576
 (iii) 586
 (iv) 556

Q7. If A is a non singular matrix then $A^{-1} =$

(i) $\frac{|A|}{adj(A)}$

(ii) $\frac{adj(A)}{|A|}$

(iii) $\frac{1}{adj(A) \cdot |A|}$

(iv) $|A \cdot adj(A)|$

Q8. Examine the continuity of function f given by $f(x) = 2x + 5$ at $x = 1$.

- (i) Continuous at $x = 1$
- (ii) Discontinuous at $x = 1$
- (iii) Discontinuous at $x = 2$
- (iv) Discontinuous at $x = 3$

Q9. Differentiate $e^{\sin x^2}$.

- (i) $e^{\sin x^2} \cdot \cos x^2 \cdot 2x$
- (ii) $e^{\sin x^2} \cdot \sin x^2$
- (iii) $e^{\sin x^2} \cdot \sin x^2 \cdot 2x$
- (iv) $e^{\sin x^2} \cdot \cos x^2$

Q10. If $f(x) = 3x^2 + 4x + 5$ then $f^{11}(x) =$

- (i) 2
- (ii) 4
- (iii) 6
- (iv) 5

Q11. The rate of change of the area of a circle with respect to its radius r when $r = 3$ cm is

- (i) $6\pi \text{ cm}^2/\text{s}$
- (ii) $8\pi \text{ cm}^2/\text{s}$
- (iii) $10\pi \text{ cm}^2/\text{s}$
- (iv) $12\pi \text{ cm}^2/\text{s}$

Q12. The slope of the tangent to the curve $y = 3x^4 - 4x$ at $x = 4$ is.

- (i) 765
- (ii) 763
- (iii) 764
- (iv) 766

Q13. The anti derivative of $\left(\sqrt{x} + \frac{1}{\sqrt{x}}\right)$ equals

- (i) $\frac{1}{3}x^{\frac{1}{3}} + 2x^{\frac{1}{2}} + C$
- (ii) $\frac{2}{3}x^{\frac{2}{3}} + \frac{1}{2}x^2 + C$
- (iii) $\frac{2}{3}x^{\frac{3}{2}} + 2x^{\frac{1}{2}} + C$
- (iv) $\frac{3}{2}x^{\frac{3}{2}} + \frac{1}{2}x^{\frac{1}{2}} + C$

Q14. $\int \frac{x dx}{(x-1)(x-2)}$ equals

(a) $\log \left| \frac{(x-1)^2}{x-2} \right| + C$

(b) $\log \left| \frac{(x-2)^2}{x-1} \right| + C$

(c) $\log \left| \left(\frac{x-1}{x-2} \right)^2 \right| + C$

(d) $\log |(x-1)(x-2)| + C$

Q15. $\int_1^{\sqrt{3}} \frac{dx}{1+x^2}$ equals

(i) $\frac{\pi}{3}$

(ii) $\frac{2\pi}{3}$

(iii) $\frac{\pi}{6}$

(iv) $\frac{\pi}{12}$

Q16. Area of the region bounded between the line $x = 4$ and the parabola $y^2 = 16x$ is

(i) $\frac{16}{3}$

(ii) $\frac{128}{3}$

(iii) $-\frac{16}{3}$

(iv) $-\frac{128}{3}$

Q17. The number of arbitrary constants in the general solution of a differential equation of fourth order are:

(i) 0

(ii) 2

(iii) 3

(iv) 4

Q18. In triangle ABC fig., which of the following not true:

(i) $\vec{AB} + \vec{BC} + \vec{CA} = \vec{0}$

(ii) $\vec{AB} + \vec{BC} - \vec{AC} = \vec{0}$

(iii) $\vec{AB} + \vec{BC} - \vec{CA} = \vec{0}$

(iv) $\vec{AB} - \vec{CB} + \vec{CA} = \vec{0}$

Q19. Let \vec{a} and \vec{b} be two unit vectors and α be the angle between them then $\vec{a} + \vec{b}$ is a unit vector, if

(i) $\alpha = \frac{\pi}{4}$

(ii) $\alpha = \frac{\pi}{3}$

(iii) $\alpha = \frac{2\pi}{3}$

(iv) $\alpha = \frac{\pi}{2}$

Q20. The direction cosines of the ray from p (1, -2, 4) to Q (-1, 1, -2) are

(i) $\langle -2, 3, -6 \rangle$

(ii) $\langle 2, -3, 6 \rangle$

(iii) $\langle \frac{2}{7}, -\frac{3}{7}, \frac{6}{7} \rangle$

(iv) $\langle -\frac{2}{7}, \frac{3}{7}, -\frac{6}{7} \rangle$