

- The straight line x + y = k touches the parabola $y = x x^2$, if k is equal to 9. (d) none of these
- (a) 0 (b) -1 (c) 1 Maximum value of $\sin x \sin 60^\circ x \sin 60^\circ + x$ is (a) $-\frac{1}{4}$ (b) $\frac{1}{4}$ (c) $\frac{3}{4}$ 10. (c) $\frac{3}{4}$ (d) none of these
- The straight line passing through the point of intersection of the straight lines x 3y + 1 = 011. and 2x + 5y - 9 = 0 and having infinite slope and at a distance 2 units form the origin has the equation (a) x = 2(b) 3x + 4y - 1 = 0(c) y = 1(d) none of these

The equation of the circle which touches the axes of co-ordinates and the line $\frac{x}{3} + \frac{y}{4} = 1$ and 12. whose centre lies in the Ist quadrant is $x^2 + y^2 - 2cx - 2cy + c^2 = 0$, where c is equal to (a) 1 (b) 2 (c) 3 (d) none of t (d) none of these

- A line is drawn through a fixed point $P(\mathbf{x}, \beta)$ to cut the circle $x^2 + y^2 = r^2$ at A and B. Then 13. PA.PB is equal to

(a) $(\alpha + \beta)^{2} - r^{2}$ (b) $\alpha^{2} + \beta^{2} - r^{2}$ (c) $(\alpha - \beta)^{2} + r^{2}$ (d) none of these 14. If $a^{1/x} = b^{1/y} = c^{1/z}$ and a, b, c are in G.P., then x, y, z are in (a) A.P. (b) G.P. (c) H.P. (d) none of these

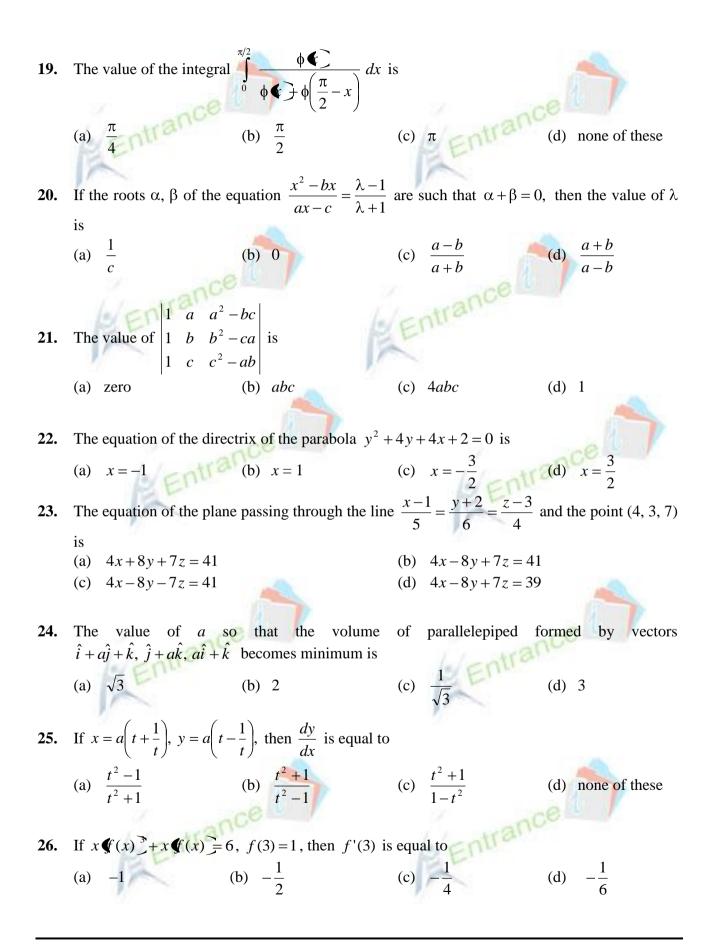
15. If z = x + iy and $w = \frac{1 - iz}{z - i}$, then |w| = 1 implies that in the complex plane (a) z lies on the imaginary axis (b) z lies on the real axis (c) z lies on the unit circle (d) none of these

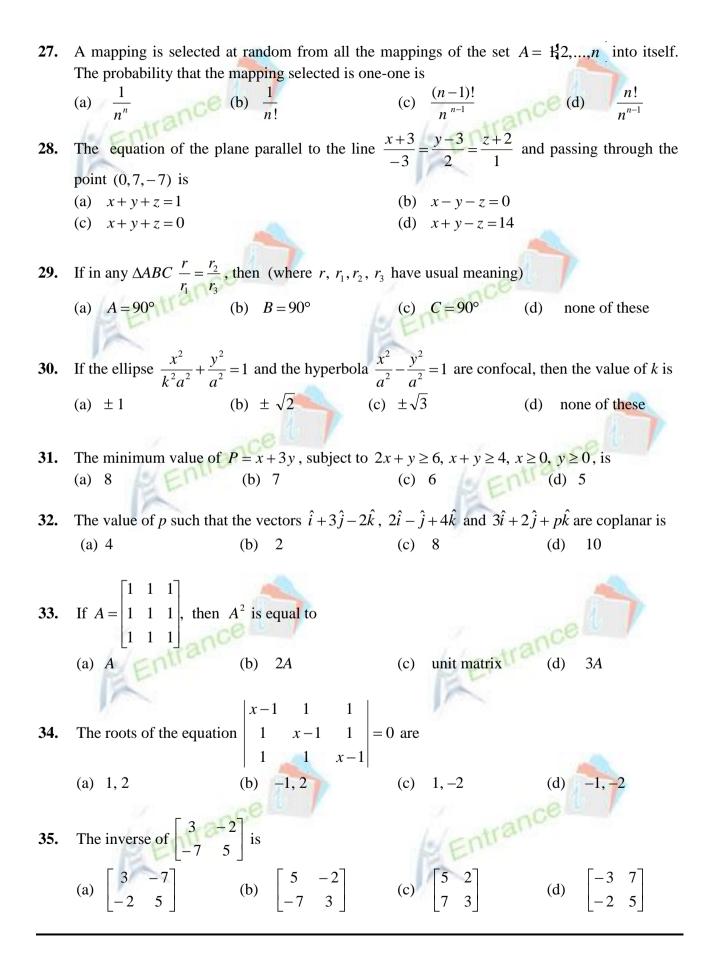
If $(+x)^n = c_0 + c_1 x + c_2 x^2 + \dots + c_n x^n$, then for n odd, $c_1^2 + c_3^2 + c_5^2 + \dots + c_n^2$ is equal to (a) 2^{2n-2} (b) 2^n (c) $\frac{2n!}{2(2!)^2}$ (d) $\frac{2n!}{(2!)^2}$ 16.

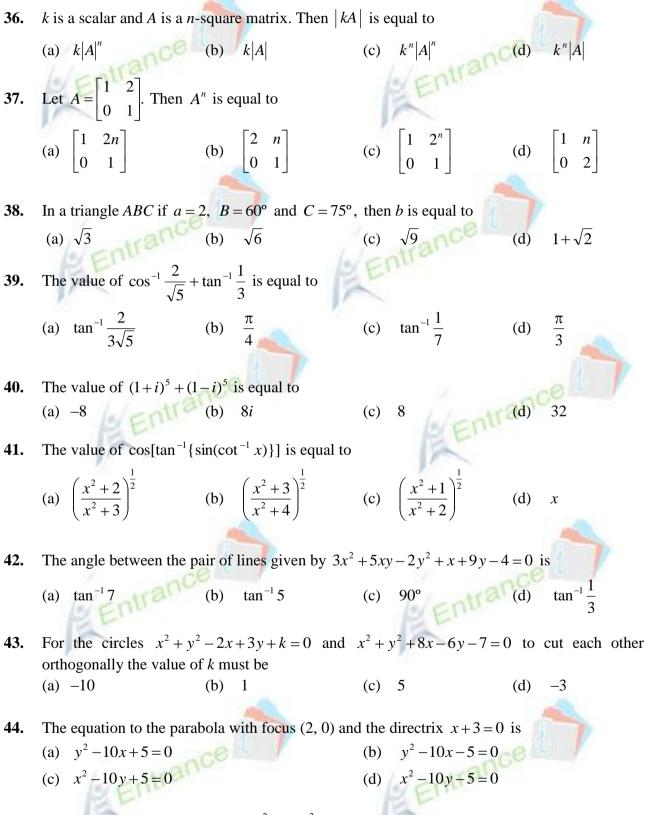
 $\lim_{x \to 2} \langle \mathbf{f}_{\mathbf{x}}^{[\mathbf{x}]} \rangle$, where [x] is the greatest integer function, is equal to 17. (a) 1 (b) -1 (c) ±1 (d) does not exist

138. Assuming that f is continuous everywhere $\frac{1}{c} \int_{ac}^{bc} f\left(\frac{x}{c}\right) dx$ is equal to

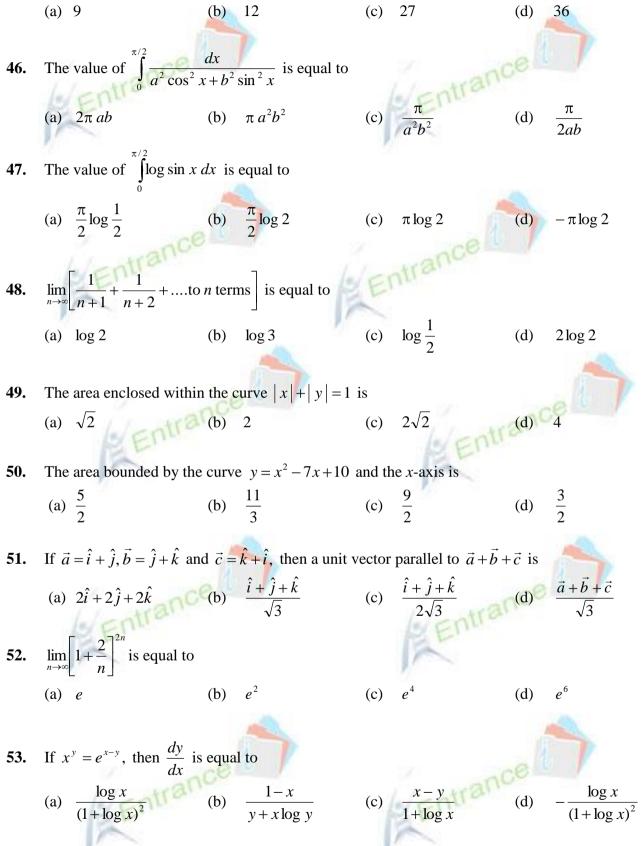
(a) $\frac{1}{c}\int_{a}^{b} f \oint dx$ (b) $\int_{a}^{b} f \oint dx$ (c) $c\int_{a}^{b} f \oint dx$ (d) $\int_{a}^{bc^{2}} f \oint dx$



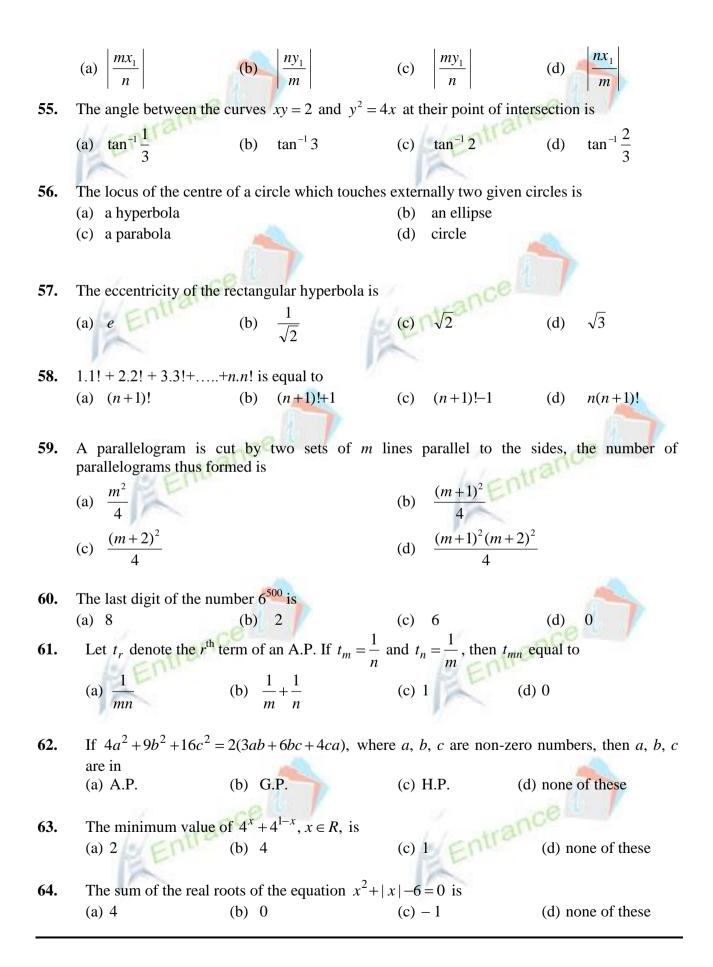




45. If *P* is any point on the ellipse $9x^2 + 36y^2 = 324$ whose foci are *S* and *S'*. Then SP + S'P is equal to



54. The length of the sub-tangent to the curve $x^m y^n = a^{m+n}$ at any point (x_1, y_1) on it is



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65.	If $x = [x+2]$, (where $x = 2, -1$)	here [.] denotes greatest in (b) $x \in [2, 3)$	teger function), the $(c) x \in [-1, 0)$	in x must not be (d) none of these
	-10-			-10-
66.	If one root of the equation $(k^2+1)x^2+13x+4k=0$ is reciprocal of the other, then k can be			
	(a) $-2 + \sqrt{3}$	(b) $2 - \sqrt{3}$	(c) 1	(d) none of these
67.	The value of $(1+i)^3$			
	(a) <i>i</i>		(c) $1 - 5i$	(d) none of these
68.	If $ z = 1$, then $\frac{1+z}{1+\overline{z}}$ is equal to (a) z (b) \overline{z} (c) $z + \overline{z}$ (d) none of these			
	(a) z	(b) <u>z</u>	(c) $z + \overline{z}$	(d) none of these
69.	The number of 5-digit numbers in which no two consecutive digits are identical is			
	(a) $9^2 \times 8^3$	(b) 9×8^4	(c) 9^5	(d) none of these
70.	In an examination of 9 papers a candidate has to pass in more papers than the number of papers in which he fails in order to be successful. The number of ways in which he can be			
	unsuccessful is			
	(a) 255	(b) 256	(c) 193	(d) 319
	$x x^2$	2 - yz = 1		ntrance
71.	The value of $\begin{vmatrix} x & x^2 \\ y & y^2 \\ z & z^2 \end{vmatrix}$	$\left \frac{z}{z} - zx \right $ is	KE	fur.
	$z z^2$	$\left 2 - xy \right $	1	
	(a) 1	(b) – 1	(c) 0	(d) - xyz
72.	A value of c for which the system of equations $x + y = 1$, $(x + 2)x + (x + 4)y = 6$,			
		v = 36 is solvable (consister		
	(a) 1	(b) -2	(c) 4	(d) none of these
	In the expansion of $\left(x^3 - \frac{1}{x^2}\right)^n$, $n \in N$, if the sum of the coefficients of x^5 and x^{10} is			
73.	In the expansion of $\left(x^{3} - \frac{1}{x^{2}}\right)$, $n \in N$, if the sum of the coefficients of x^{3} and x^{10} is 0,			
	then <i>n</i> is (a) 25	(b) 20	(c) 15	(d) none of these
	(a) 25	(0) 20	(0) 15	(d) none of these
74.	The middle term in t	the expansion of $\left(\frac{2x}{3} - \frac{3}{2x}\right)$	$\left(\frac{1}{2}\right)^{2n}$ is	
	The middle term in the expansion of $\left(\frac{2x}{3} - \frac{3}{2x^2}\right)^{2n}$ is (a) ${}^{2n}C_n$ (b) $(-1)^n \frac{(2n)!}{(n!)^2} \cdot x^{-n}$ (c) ${}^{2n}C_n \cdot \frac{1}{x^n}$ (d) none of these			
	(a) C_n	(b) (-1) $\frac{1}{(n!)^2} \cdot x$	(c) $C_n \cdot \frac{1}{x^n}$	(d) none of these
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75. If
$$A = \begin{bmatrix} 0 & c & -b \\ -c & 0 & a \\ b & -a & 0 \end{bmatrix}$$
 and $B = \begin{bmatrix} a^2 & ab & ac \\ ba & b^2 & bc \\ ca & cb & c^2 \end{bmatrix}$, then *AB* is equal to
(a) *O* (b) *I* (c) 2*I* (d) none of these
76. If $\begin{bmatrix} x+y & y \\ 2x & x-y \end{bmatrix} \begin{bmatrix} 2 \\ -1 \end{bmatrix} = \begin{bmatrix} 3 \\ 2 \end{bmatrix}$, then *xy* is equal to
(a) -5 (b) 5 (c) 4 (d) 6
77. If $\cos(x-y)$, $\cos x$ and $\cos(x+y)$ are in H.P., then $\begin{vmatrix} \cos x \sec \frac{y}{2} \end{vmatrix}$ equals
(a) 1 (b) 2 (c) $\sqrt{2}$ (d) none of these
78. If $\cos \alpha = \frac{1}{2} \left(x + \frac{1}{x} \right)$, $\cos \beta = \frac{1}{2} \left(y + \frac{1}{y} \right)$, then $\cos \alpha - \beta$) is equal to
(a) $\frac{x}{y} + \frac{y}{x}$ (b) $xy + \frac{1}{xy}$ (c) $\frac{1}{2} \left(\frac{x}{y} + \frac{y}{x} \right)$ (d) none of these
79. The number of solutions of $\sin^2 \theta + 3\cos \theta = 3$ in $[-\pi, \pi]$ is
(a) 4 (b) 2 (c) 0 (d) none of these
80. The principal value of $\cos^{-1} \left\{ \frac{1}{\sqrt{2}} \left(\cos \frac{9\pi}{10} - \sin \frac{9\pi}{10} \right) \right\}$ is
(a) $\frac{3\pi}{20}$ (b) $\frac{7\pi}{20}$ (c) $\frac{7\pi}{10}$ (d) none of these
81. The solution set of $\log_2 |4 - 5x| > 2$ is
(a) $\left(\frac{8}{5}, \infty \right)$ (b) $\left(\frac{4}{5}, \frac{8}{5} \right)$
(c) $(-\infty, 0) \cup \left(\frac{8}{5}, \infty \right)$ (d) none of these
82. In a ΔABC , $(c + a + b) (a + b - c) = ab$, then the measure of $\angle C$ is
(a) $\frac{\pi}{3}$ (b) $\frac{\pi}{6}$ (c) $\frac{2\pi}{3}$ (d) none of these
83. A vertical hamppost, 6 m high, stands at a distance of 2 m from a wall, 4 m high. A 1.5 m tall man starts to walk away from the wall on the other skied of the wall, in line with the lamppost. The maximum distance to which the man can walk remaining in the shadow is
(a) $\frac{5}{2}$ m (b) $\frac{3}{2}$ m (c) 4 m (d) none of these

- 84. The equation of the straight line which bisects the intercepts made by the axes on the lines x + y = 2 and 2x + 3y = 6 is (a) 2x = 3 (b) y = 1 (c) 2y = 3 (d) x = 1
- 85. If the lines y x = 5, 3x + 4y = 1 and y = mx + 3 are concurrent, then the value of *m* is (a) $\frac{19}{5}$ (b) 1 (c) $\frac{5}{10}$ (d) none of these
- 86. A point on the line y = x whose perpendicular distance from the line $\frac{x}{4} + \frac{y}{3} = 1$ is 4, has the co-ordinates
 - (a) $\left(\frac{8}{7}, \frac{8}{7}\right)$ (b) $\left(\frac{32}{7}, \frac{32}{7}\right)$ (c) $\left(\frac{3}{2}, \frac{3}{2}\right)$ (d) none of these
- 87. If $2(x^2 + y^2) + 4\lambda x + \lambda^2 = 0$ represents a circle of meaningful radius then the range of real values of λ is (a) R (b) $(0, \infty)$ (c) $(-\infty, 0)$ (d) none of these
- 88. If the line $\lambda x + \mu y = 1$ is a normal to the circle $2x^2 + 2y^2 5x + 6y 1 = 0$, then (a) $5\lambda - 6\mu = 2$ (b) $4 + 5\mu = 6\lambda$ (c) $4 + 6\mu = 5\lambda$ (d) none of these
- 89. If (2, -8) is an end of a focal chord of the parabola $y^2 = 32x$, then the coordinates of other end of the chord is (a) (32, 32) (b) (32, -32) (c) (-2, 8) (d) none of these
- 90. The triangle formed by the tangents to a parabola $y^2 = 4ax$ at the ends of the latus rectum and the double ordinate through the focus is
 - (a) equilateral
 - (b) isosceles
 - (c) right-angled isosceles
 - (d) dependent on the value of a for its classification
- **91.** If two foci of an ellipse be (-2, 0) and (2, 0) and its eccentricity is $\frac{2}{3}$, then the ellipse has the equation

Entrance

- (a) $5x^2 + 9y^2 = 45$ (b) $9x^2 + 5y^2 = 45$ (c) $5x^2 + 9y^2 = 90$ (d) $9x^2 + 5y^2 = 90$ (e) $y^2 + 5y^2 = 90$ (f) $y^2 + 5y^2 = 90$
- 92. The foci of the ellipse $\frac{x^2}{16} + \frac{y^2}{b^2} = 1$ and the hyperbola $\frac{x^2}{144} \frac{y^2}{81} = \frac{1}{25}$ coincide, then the value of b^2 is (a) 5 (b) 7 (c) 9 (d) 1

