jee-main-maths-02-09-2020-shift-2

EE24BTECH11030 - J.KEDARANANDA

1) A line parallel to the straight line 2x - y = 0 is tangent to the hyperbola $\frac{x^2}{4} - \frac{y^2}{2} = 1$ at the point (x_1, y_1) . Then $x_1^2 + 5y_1^2$ is equal to:

2) The domain of the function $f(x) = \sin^{-1}\left(\frac{|x|+5}{x^2+1}\right)$ is $(-\infty, -a] \cup [a, \infty)$. Then a is equal to:

c) $\frac{1+\sqrt{17}}{2}$

c) 8

d) 5

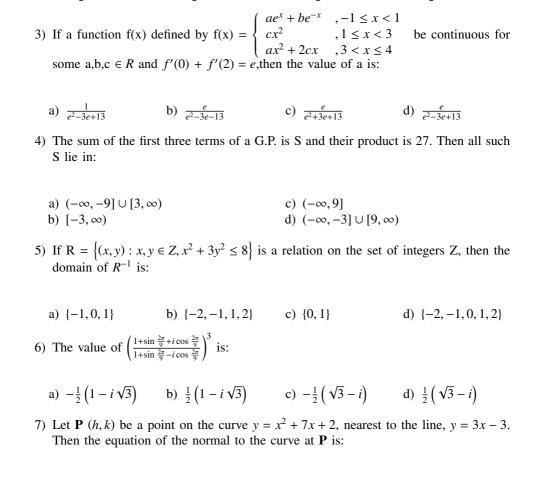
d) $\frac{\sqrt{17}}{2} + 1$

b) 10

b) $\frac{\sqrt{17}}{2}$

a) 6

a) $\frac{\sqrt{17}-1}{2}$



a) $x + 3y - 62 = 0$ b) $x - 3y - 11 = 0$ c) $x - 3y + 22 = 0$ d) $x + 3y + 26 = 0$
a) $x + 3y = 02 = 0$ b) $x = 3y = 11 = 0$ c) $x = 3y + 22 = 0$ d) $x + 3y + 20 = 0$
8) Let A be a 2×2 real matrix with entries from $\{0,1\}$ and $ A \neq 0$. Consider the
following two statements:
(P) If A $\neq I_2$, then $ A = -1$
(Q) If $ A = 1$, then $tr(A) = 2$,
where I_2 denotes 2×2 identity matrix and tr(A) denotes the sum of the diagonal
entries of A. Then:

a) :	Both	(P)	and	(Q)	are	false
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c) Both (P) and (Q) are true

b) (P) is true and (Q) is false

d) (P) is false and (Q) is true

9) Box I contains 30 cards numbered 1 to 30 and Box II contains 20 cards numbered 31 to 50. A box is selected at random and a card is drawn from it. The number on the card is found to be a non-prime number. The probability that the card was drawn from Box I is:

a) $\frac{4}{17}$

b) $\frac{8}{17}$

c) $\frac{2}{5}$

d) $\frac{2}{3}$

10) If p(x) be a polynomial of degree three that has a local maximum value 8 at x=1 and a local minimum value 4 at x=2; then p(0) is equal to:

a) 12

b) -12

c) -24

d) 6

11) The contrapositive of the statement "If I reach the station in time, then I will catch the train" is:

- a) If I will catch the train, then I reach the station in time.
- b) If I do not reach the station in time, then I will catch the train.
- c) If I do not reach the station in time, then I will not catch the train.
- d) If I will not catch the train, then I do not reach the station in time.

12) Let α and β be the roots of the equation, $5x^2 + 6x - 2 = 0$. If $S_n = \alpha^n + \beta^n$, n=1,2,3,...., then:

a) $5S_6 + 6S_5 + 2S_4 = 0$

c) $6S_6 + 5S_5 + 2S_4 = 0$

b) $6S_6 + 5S_5 = 2S_4$

d) $5S_6 + 6S_5 = 2S_4$

13) If the tangent to the curve $y = x + \sin y$ at a point (a,b) is parallel to the line joining $\left(0, \frac{3}{2}\right)$ and $\left(\frac{1}{2}, 2\right)$, then:

- a) $b = \frac{\pi}{2} + a$ b) |a + b| = 1 c) |b a| = 1 d) b = a

- 14) Area (in sq. units) of the region outside $\frac{|x|}{2} + \frac{|y|}{3} = 1$ and inside the ellipse $\frac{x^2}{4} + \frac{y^2}{9} = 1$ is:
 - a) $3(\pi 2)$
- b) $6(\pi 2)$ c) $6(4 \pi)$ d) $3(4 \pi)$
- 15) If |x| < 1, |y| < 1 and $x \ne y$, then the sum to infinity of the following series $(x + y) + (x^2 + xy + y^2) + (x^3 + x^2y + xy^2 + y^3) + \dots$ is:

 - a) $\frac{x+y+xy}{(1-x)(1-y)}$ b) $\frac{x+y-xy}{(1-x)(1-y)}$ c) $\frac{x+y+xy}{(1+x)(1+y)}$ d) $\frac{x+y-xy}{(1+x)(1+y)}$