AP EAMCET Mathematics Previous Questions with Key – Test 7

1)If f: R → [-1, 1] and g: R →A are two surjective mappings and

$\sin\left(g(x)-\frac{\pi}{3}\right)=\frac{f(x)}{2}\sqrt{4-f^2(x)}$, then A =

1)$\left[0,\frac{2\pi}{3}\right]$ 2)[-1, 1] 3)$\left(\frac{-\pi}{2},\frac{\pi}{2}\right)$ 4)(0, π)

2)The domain of the function $f(x)=\sqrt{\frac{4-x^2}{[x]+2}}$, where [x] denotes the greatest integer not more then x, is

1)(-∞, -2) ∪ (1, 2) 2)(-∞, -2) ∪ (-1, 2)

3)(-∞, -2) ∪ [-1, 2] 4)(-∞, -1) ∪ (1, 2)

3)If $a_n=\sqrt{7+\sqrt{7+\sqrt{7+....n\,times}}}$, then which one of the following is true?

1)$a_n > 7\ \forall n \geq 1$ 2)$a_n > 3\ \forall n \geq 1$

3)$a_n < 4\ \forall n \geq 1$ 4)$a_n < 3\ \forall n \geq 1$

4)If A is a square matrix of order 3, and $A^2 + A + 2I = 0$, then

1)A can not be a skew-symmetric matrix

2)|A+I| = 0

3)A is non singular and $A^{-1} = (A + I)^{-1}$

4)|A| |A+I| = 2

5)If A is a square matrix of order 3, then consider the following statements

I: If |A| = 0 then |Adj A| = 0

II: If |A| ≠ 0, then $|A^{-1}| = |A|^{-1}$

Which of the above statements is/are true?

1)Both I and II 2)Neither I nor II

3)I only 4)II only

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6)The system of equations x -2y + 3z = 5, 2x – 2y + z = 0, -x + 2y – 3z = 6 has

1)infinitely many solutions

2)exactly two solutions

3)unique solution

4)no solution

7)The amplitude of $\sin\frac{\pi}{5}+i\left(1-\cos\frac{\pi}{5}\right)$ is

1)$\frac{\pi}{15}$

2)$\frac{\pi}{10}$

3)$\frac{\pi}{5}$

4)$\frac{2\pi}{5}$

8)If a point P denotes a complex number z = x + iy in the Argand plane and if $\frac{z+1}{z+i}$ is a purely real number, then the locus of P is

1)$x + y + 1 = 0$ 2)$x^2 + y^2 + x + y = 0$

3)$x^2 + y^2 + 2y + 1 = 0, (x, y) \neq (0, -1)$ 4)$x + y + 1 = 0, (x, y) \neq (0, -1)$

9)If ω is a complex cube root of unity, then $\left[\frac{51+73\omega+87\omega^2}{73+87\omega+51\omega^2}+\frac{51+73\omega+87\omega^2}{87+51\omega+73\omega^2}\right]^{15}=$

1)1 2)-1 3)0 4)2

10)If $z \in C$ and $iz^3 + 4z^2 - z + 4i = 0$, then a complex root of this equation having minimum magnitude is

1)4i 2)$\frac{1-i}{\sqrt{2}}$ 3)$\frac{\sqrt{3}+i}{2}$ 4)$\frac{1+i}{\sqrt{2}}$

11)If α, β are the roots of the equation x^2 -4x + 5 = 0, then the quadratic equation whose roots are $\alpha^2 + \beta$ and $\alpha + \beta^2$ is

1)$x^2 + 10x + 34 = 0$

2)$x^2 - 10x + 34 = 0$

3)$x^2 - 10x - 34 = 0$

4)$x^2 + 10x - 34 = 0$

12)f(x) is a quadratic expression such that f(x) is negative when $x \in \left(-\infty, -\frac{5}{3}\right) \cup (3, \infty)$ and positive when $x \in \left(-\frac{5}{3}, 3\right)$. g(x) is another quadratic expression such that g(x) is negative when $x \in \left(3, \frac{9}{2}\right)$ and positive when $x \in R - \left[3, \frac{9}{2}\right]$. Then the sign of f(x) g(x) in [0, 5] is

1)Positive in $\left[0, \frac{9}{2}\right]$ and negative in $\left(\frac{9}{2}, 5\right)$

2)Positive in $[0,3) \cup \left(3, \frac{9}{2}\right)$ and negative in $\left(\frac{9}{2}, 5\right]$

3)Positive in $[0,3) \cup \left(3, \frac{9}{2}\right) \cup \left(\frac{9}{2}, 5\right]$

4)Negative in $[0,3) \cup \left(3, \frac{9}{2}\right) \cup \left(\frac{9}{2}, 5\right]$

13)If a, b, c ∈ R be such that 4a + 2b + c > 0 and $ax^2 + bx + c = 0$ has no real roots, then the value of (c + a) (c + b) is

1)greater than ab   2)less than bc

3)greater than ca   4)less than ab + bc + ca

14)The minimum degree of a polynomial equation with rational coefficients having $\sqrt{3}+\sqrt{27}, \sqrt{2}+5i$ as two of its roots is

1)8   2)6   3)4   4)2

15)If all the digits in the number 53426 are permuted in all possible ways and are arranged in decreasing order, then the number having rank 89, is

1)34265

2)34256

3)43526

4)43265

16)Three parallel straight lines L_1, L_2 and L_3 lie on the same plane, Consider 5 points on L_1, 7 points on L_2 and 9 points on L_3. Then the maximum possible number of triangles formed with vertices at these points, is

1)1330

2)1200

3)1201

4)129

17)If a > 0 and the coefficient of x^2 in the expansion of $\left(ax^3 + \frac{c}{x}\right)^6$ is 60, then ac^2 =

1)2

2)3

3)4

4)5

18)If $x = \frac{3}{4\cdot 8} + \frac{3\cdot 5}{4\cdot 8\cdot 12} + \frac{3\cdot 5\cdot 7}{4\cdot 8\cdot 12\cdot 16} + ...,$ then $2x^2 + 5x$ =

1)$\frac{7}{8}$

2)7

3)$\frac{7}{16}$

4)$\frac{7}{4}$

19)If $\frac{3x^2+1}{(x^2+1)(x^2+2)^2} = \frac{Ax+B}{x^2+1} + \frac{Cx+D}{x^2+2} + \frac{Ex+F}{(x^2+2)^2}$, then A + C + E =

1)0

2)$\frac{7}{3}$

3)1

4)$\frac{4}{3}$

20)If $\tan\left(\frac{\pi}{4}+\frac{y}{2}\right) = \tan^3\left(\frac{\pi}{4}+\frac{x}{2}\right)$, then $\frac{3\sin x + \sin^3 x}{1+3\sin^2 x} =$

1)0

2)1

3)sin 2y

4)sin y

21)(cos 252° - sin 126°) (cos 252° + sin 126°) ($\sin^2$ 126° + $\sin^2$ 186° + $\sin^2$ 66°)=

1)$\frac{3\sqrt{5}}{8}$

2)$\frac{-3\sqrt{5}}{8}$

3)$\frac{-3\sqrt{5}}{4}$

4)$\frac{3\sqrt{5}}{4}$

22)If α, β, γ are any three angles, then cosα + cosβ - cosγ -cos(α+β+γ)=

1) $4\cos\frac{\alpha+\beta}{2}\cos\frac{\beta+\gamma}{2}\cos\frac{\gamma+\alpha}{2}$

2) $4\cos\frac{\alpha+\beta}{2}\sin\frac{\beta+\gamma}{2}\sin\frac{\gamma+\alpha}{2}$

3) $4\cos\frac{\alpha+\beta}{2}\sin\frac{\beta-\gamma}{2}\sin\frac{\gamma-\alpha}{2}$

4) $4\sin\frac{\alpha+\beta}{2}\cos\frac{\beta+\gamma}{2}\cos\frac{\gamma+\alpha}{2}$

23)The general solution of the equation $\sqrt{3-5\sin x+\sin^2 x}+\cos x=0$ is

1) $n\pi+(-1)^n\frac{\pi}{6}, n\in Z$

2) $2n\pi\pm\frac{\pi}{6}, n\in Z$

3) $(2n+1)\pi-\frac{\pi}{6}, n\in Z$

4) $2n\pi\pm\frac{5\pi}{6}, n\in Z$

24)Consider the following statements

I. $\sin^{-1}\left(y^2-4y+6\right)+\cos^{-1}\left(y^2-4y+6\right)=\frac{\pi}{2}.\forall y\in R$

II. $\sin^{-1}\left(y^2-4y+6\right)+\operatorname{cosec}^{-1}\left(y^2-4y+6\right)=\frac{\pi}{2}.\forall y\in R$

Which of the above statement(s) is/are true?

1)only I 2)only II

3)Both I and II 4)Neither I nor II

25)If sec θ cosh y = cosec x and cosec θ sinh y = sec x, then $\sinh^2 y$ =

1)$\cos^2 x$ 2)cos x 3)$\sin^2 x$ 4)sin x

26)Consider the following statements:

I. In triangle ABC, if c = 6 and $\cos C=\frac{-11}{25}$ *then* $R=\frac{25}{2\sqrt{14}}$

II. In triangle ABC, if a = 3, b = 4, c = 6, then ABC is acute angled triangle.

Which of the above statements is/are true?

1)only I 2)only II 3)Both I and II 4)Neither I nor II

27)In triangle ABC, if a= 3, b= 4, c= 6, then $\frac{\cot\frac{A}{2}+\cot\frac{B}{2}+\cot\frac{C}{2}}{\cot A+\cot B+\cot C}=$

1)$\frac{13}{61}$ 2)$\frac{169}{61}$ 3)$\frac{61}{169}$ 4)$\frac{61}{13}$

28)If the reciprocals of the lengths of the sides of a ΔABC are in harmonic progression, then its exradii r_1, r_2, r_3 are in

1)Arithmetic progression

2)Geometric progression

3)Harmonic progression

4)Arithmetico-geometric progression

29)If P and Q are two points on the curve $y = 2^{x+2}$ such that $\overline{OP} \cdot \bar{i} = -1$ and $\overline{OQ} \cdot \bar{i} = 2$, then the magnitude of $\left(\overline{OQ} - 4\overline{OP}\right)$ is

1)10

2)1

3)5

4)100

30)P and Q are points on the straight line passing through the point $A\left(3\bar{i}+\bar{j}-\bar{k}\right)$ and parallel to the vector $2\bar{i}-\bar{j}+2\bar{k}$. If AP = AQ = 3, then the vector equation of the plane OPQ is

1)$\bar{r} = (s+5t)\bar{i} + 2s\bar{j} + (t-3s)\bar{k}$

2)$\bar{r} = \left(3\bar{i}+\bar{j}-\bar{k}\right) + s\left(2\bar{i}-\bar{j}+2\bar{k}\right) + t\left(5\bar{i}+\bar{k}\right)$

3)$\bar{r} = (s+5t)\bar{i} + 2s\bar{j} + (5s+t)\bar{k}$

4)$\bar{r} = (3t+s)\bar{i} + 2s\bar{j} + (t-3s)\bar{k}$

31)Let $\bar{m}$ be the unit vector orthogonal to the vector $\bar{i}-\bar{j}+\bar{k}$ and coplanar with the vectors $2\bar{i}+\bar{j}$ and $\bar{j}-\bar{k}$. If $\bar{a} = \bar{i}-\bar{k}$, then the length of the perpendicular from the origin to the plance $\bar{r}\cdot\bar{m} = \bar{a}\cdot\bar{m}$ is

1)$\frac{1}{\sqrt{26}}$ 2)$\frac{1}{\sqrt{5}}$ 3)$\frac{5}{\sqrt{26}}$ 4)1

32)If $\bar{a},\bar{b},\bar{c}$ are non-coplanar unit vectors such that $\bar{a}\times(\bar{b}\times\bar{c})=\frac{\bar{b}+\bar{c}}{\sqrt{2}}$, then the angle between $\bar{a}$ and $\bar{b}$ is

1)$\frac{\pi}{6}$

2)$\frac{\pi}{4}$

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

4)$\frac{3\pi}{4}$

33)If $\bar{a}$ *and* $\bar{b}$ are two unit vectors such that $\bar{c}=(\bar{a}\times\bar{c})+\bar{b}$, then the maximum value of $[\bar{a}\,\bar{b}\,\bar{c}]$ is

1)1 2)$\frac{1}{2}$ 3)$\frac{3}{2}$ 4)2

34)If $\bar{\alpha},\bar{\beta}$ *and* $\bar{\gamma}$ are non zero vectors such that $|\bar{\beta}|+|\bar{\gamma}|=1$ and $|\bar{\alpha}|=10$, then

$(\bar{\alpha}\times(\bar{\beta}+\bar{\gamma}))\times(\bar{\beta}+\bar{\gamma}).(\bar{\beta}-\bar{\gamma})=$

1)10

2)1

3)0

4)12

35)The arithmetic mean and standard deviation of a data of nine numbers are 13 and 5 respectively. If 3 is included as the 10^{th} item of the data. Then the variance of the data of ten numbers is

1)23.5

2)21.5

3)31.5

4)27

36)The variance of the following distribution is

Marks	1-3	3-5	5-7	7-9
Number of students	40	30	20	10

1)2

2)4

3)6

4)8

37)A and B are two events such that P(A)= 0.58, P(B)= 0.32 and $P(A \cap B) = 0.28$. Then the probability that neither A and B occurs is

1)0.38 2)0.62 3)0.72 4)0.9

38)Two dice are thrown simultaneously. If A is event of getting the sum of the numbers on two dice as greater than or equal to 8 and B is the event of getting a number less than or equal to 3 on at least one of the die. Then P(B/A)=

1)$\frac{5}{15}$ 2)$\frac{6}{15}$ 3)$\frac{7}{15}$ 4)$\frac{8}{15}$

39)A bag contains 6 balls. If 4 balls are drawn at a time and all of them are found to be red, then the probability that exactly 5 of the balls in the bag are red is

1)$\frac{10}{19}$ 2)$\frac{5}{21}$ 3)$\frac{1}{21}$ 4)$\frac{5}{7}$

40)If the probability distribution of a random variable X is given by

$X = x_i$: 0 1 2 3

$P(X = x_i)$: $\frac{1}{8}$ $\frac{3}{8}$ 3K K

Then the variance of X is

1)3 2)$\frac{9}{4}$ 3)$\frac{3}{2}$ 4)$\frac{3}{4}$

41)A manufacture of locks knows that 2% of his product is defective. If he sells the locks in boxes each with 100 locks and guarantees that not more than 2 locks will be defective in a box, then the probability that a box will fail to meet the guaranteed quality is

1)$1 - 5e^{-2}$

2)$\sum_{k=2}^{100} 100_{C_k} \left(\frac{1}{50}\right)^k \left(\frac{49}{50}\right)^{100-k}$

3)0.02

4)$1-3e^{-2}$

42)The equation of the locus of a point (2 cos θ -3, 3 sin θ - 4) is

1)$9x^2 + 4y^2 + 54x + 32y + 181 = 0$

2)$4x^2 + 9y^2 + 54x + 32y + 109 = 0$

3)$9x^2 + 4y^2 - 54x + 32y + 109 = 0$

4)$9x^2 + 4y^2 + 54x + 32y + 109 = 0$

43)When the origin is shifted to the point (2, 3) and then the coordinate axes are rotated through an angle $\frac{\pi}{3}$ in the counter clockwise sense, then the transformed equation of $3x^2 + 2xy + 3y^2 - 18x - 22y + 50 = 0$ is

1)$3x^2 + 3y^2 - 1 = 0$

2)$(6 + \sqrt{3})x^2 - 2xy + (6 - \sqrt{3})y^2 - 2 = 0$

3)$4x^2 + 2y^2 - 1 = 0$

4) $(6 - \sqrt{3})x^2 + (6 + \sqrt{3})y^2 + 2xy = 0$

44)A straight line L with negative slope passes through the point (1, 1) and cuts the positive coordinate axes at the points A and B. If O is the origin, then the minimum value of OA + OB as L varies, is

1)1

2)2

3)3

4)4

45)If the straight line L = 3x + 4y – k = 0 cuts the line segment joining the points P(2, -1) and Q(1, 1) in the ratio 4:1, then the equation of the line parallel to the line y = x and concurrent with the lines PQ and L = 0 is

1)2x – 2y + 7 = 0

2)x – y + 1 = 0

3)5x – 5y – 3 = 0

4)y = x + 3

46)The orthocentre and the centroid of ΔABC are (5, 8) and $\left(3, \frac{14}{3}\right)$ respectively. The equation of the side BC is x – y = 0. Given that the image of the orthocentre of a triangle with respect to any side lies on the circumcircle of that triangle, then the diameter of the circumcircle of ΔABC is

1) $\sqrt{10}$

2) $2\sqrt{10}$

3) $4\sqrt{10}$

4) $8\sqrt{10}$

47)If a pair of perpendicular lines through the origin together with the straight line 2x + 3y = 6 form an isosceles triangle then the area of that triangle (in sq. units) is

1) $\frac{6}{\sqrt{13}}$ 2) $\frac{6}{13}$ 3) $\frac{36}{13}$ 4) $\frac{27}{13}$

48)If the equation $3x^2 + 7xy + 2y^2 + 2gx + 2fy + 2 = 0$ represents a pair of intersecting lines and the square of the distance of their point of intersection from the origin is $\frac{2}{5}$ then $f^2 + g^2 =$

1) $\frac{25}{4}$

2)25

3)50

4) $\frac{25}{2}$

49)From a point P(0, b) two tangents are drawn to the circle $x^2 + y^2 = 16$ and these two tangents intersect x-axis at two points A and B. If the area of triangle ΔPAB is minimum, then the equation of its circumcircle is

1)$x^2 + y^2 = 16\sqrt{2}$

2)$x^2 + y^2 = 64$

3)$x^2 + y^2 = 32$

4)$x^2 + y^2 = 4\sqrt{2}$

50)If the angle between the tangents drawn to the circle $x^2 + y^2 - 12x - 16y = 0$ at the points where the line 5y = 5x + k cut the circle is 60°, then the value of k is

1)$5+\sqrt{2}$

2)$5\left(2\pm 5\sqrt{2}\right)$

3)$2\pm 5\sqrt{2}$

4)$5\pm 5\sqrt{2}$

51)If a circle S with radius 5 touches the circle $x^2 + y^2 - 6x - 4y - 12 = 0$ at (-1, -1) then the length of the tangent from the centre of the circle S to the given circle is

1)$5\sqrt{3}$ 2)$\sqrt{65}$ 3)10 4)$3\sqrt{11}$

52)If a circle S passing through the point (3, 4) cuts the circle $x^2 + y^2 + 36$ orthogonally, then the locus of the centre of S is

1)$x^2 + y^2 - 6x - 8y + 11 = 0$ 2)$6x + 8y - 61 = 0$

3)$x^2 + y^2 - 8x - 6y + 11 = 0$ 4)$6x + 8y + 11 = 0$

53)The line $x - 2 = 0$ cuts the circle $x^2 + y^2 - 8x - 2y + 8 = 0$ at A and B. The equation of the circle passing through the points A and B and having least radius is

1)$x^2 + y^2 - 4x + 2y - 1 = 0$ 2)$x^2 + y^2 - 4x - 2y = 0$

3)$x^2 + y^2 - 4x - 2y + 1 = 0$ 4)$x^2 + y^2 - 4x + 4y = 0$

54)If a perpendicular drawn through the vertex O of the Parabola $y^2 = 4ax$ to any of its tangent meets the tangent at N and the parabola at M, then $ON \cdot OM =$

1)$4a^2$

2)$3a^2$

3)$2a^2$

4)a^2

55)Let α_1 and α_2 be the ordinates of two points A and B on A parabola $y^2 = 4ax$ and let α_3 be the ordinate of the point of intersection of its tangents at A and B. Then $\alpha_3 - \alpha_2 =$

1)$\alpha_3 - \alpha_1$

2)$\alpha_3 + \alpha_1$

3)α_1

4) $\alpha_1 - \alpha_3$

56)The equations of the latus recta of the ellipse $9x^2 + 4y^2 - 18x - 8y - 23 = 0$ are

1) $x = -1 \pm \sqrt{5}$

2) $y = 1 \pm \sqrt{5}$

3) $x = 1 \pm \frac{2\sqrt{5}}{3}$

4) $y = 2 \pm \sqrt{5}$

57)The equation of the tangent to the ellipse $4x^2 + 9y^2 = 36$ at the end of the latus rectum lying in the second quadrant, is

1)$\sqrt{5}x - 3y + 1 = 0$

2)$x - 3y + \sqrt{5} = 0$

3)$\sqrt{5}x - 3y + 3 = 0$

4)$\sqrt{5}x - 3y + 9 = 0$

58)If the product of the lengths of the perpendiculars from any point on the hyperbola $16x^2 - 25y^2 = 400$ to its asymptotes is p and the angle between the two asymptotes is θ then p $\tan\frac{\theta}{2} =$

1) $\frac{400}{41}$

2) $\frac{320}{41}$

3) $\frac{4}{5}$

4) $\frac{25}{16}$

59)A(3, 2, -1), B(4, 1, 1), C(6, 2, 5) and D(3, 3, 3) are four points. G_1, G_2, G_3 and G_4 respectively are the centroids of the triangles BCD, CDA, DAB and ABC. The point of concurrence of the lines AG_1, BG_2, CG_3 and DG_4 is

1)(4, 2, 2)

2)(2, 4, 2)

3)(2, 2, 4)

4)(2, 2, 2)

60)The acute angle between the lines whose direction cosines are given by the equations l + m + n = 0 and 2lm + 2ln – mn = 0 is

1) $\frac{\pi}{6}$

2) $\frac{\pi}{4}$

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

4) $\frac{2\pi}{5}$

61)A variable plane passes through a fixed point (α, β, γ) and meets the coordinate axes in A, B and C. Let P_1, P_2 and P_3 be the planes passing through A, B, C and parallel to the coordinate planes YZ, ZX, XY respectively. Then the locus of the point of intersection of the planes P_1, P_2 and P_3 is

1)$\alpha x + \beta y + \gamma z = 1$

2)$\frac{\alpha}{x}+\frac{\beta}{y}+\frac{\gamma}{z}=1$

3)$\alpha x^2 + \beta y^2 + \gamma z^2 = 1$

4)$\alpha\beta x + \beta\gamma y + \alpha\gamma z = 1$

62) $\lim_{x\to\frac{\pi}{2}} \frac{1+\cos 2x}{\cot 3x\left(3^{\sin 2x}-1\right)} =$

1)$\frac{1}{3\log 9}$

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

3)$\frac{1}{3\log 3}$

4)$\frac{3}{\log 3}$

63)$\lim_{n\to\infty} n^{-nk}\left\{(n+1)\left(n+\frac{1}{2}\right)\left(n+\frac{1}{2^2}\right)\ldots\left(n+\frac{1}{2^{k-1}}\right)\right\}^n =$

1)2

2)$e^{2\left(1-\frac{1}{2^k}\right)}$

3)$^{2\left(1-\frac{1}{2^k}\right)}$

4)e^2

64)If a and b(a > b) are points of discontinuity of the function

$$f(x) = \begin{cases} 3-2x^2 & , for\ x\le 0 \\ 2x+3 & , for\ 0<x\le 1 \\ 2x^2-3x & , for\ 1<x<2 \\ 2x-3 & , for\ 2\le x<3 \\ |x| & , for\ x\ge 3 \end{cases}$$

then 3a - b =

1)3

2)7

3)5

4)1

65)For -1 < x < 1, if f(x)= $\cos^2\left(Tan^{-1}\sqrt{\frac{1-x}{1+x}}\right)$ then f`(x) =

1)$\frac{1}{2}$

2)1

3)-1

4)$-\frac{1}{2}$

66)f : R $\rightarrow$ R is a function such that f(0) = 1 and for all x, y $\in$ R

f(xy + 1) = f(x)f(y) –f(y) –x + 2 then $\frac{df}{dx}$ at x = e is

1)0

2)-1

3)e

4)1

67) $y=\sin\left(\log\left(x^2+2x+1\right)\right)\Rightarrow(x+1)^2\frac{d^2y}{dx^2}+(x+1)\frac{dy}{dx}=$

1)y

2)-4y

3)4y

4)-y

68)The acute angle between the tangents drawn at the point of intersection (other than the origin) of the curves $x^2 = 4y$ and $y^2 = 4x$ is

1) $Tan^{-1}\left(\frac{1}{2}\right)$

2) $\sin^{-1}\left(\frac{3}{5}\right)$

3) $\cos^{-1}\left(\frac{1}{3}\right)$

4) $Tan^{-1}\left(\frac{2}{3}\right)$

69)If x > 0 then $\frac{x}{1+x}-\log(1+x)$

1)is less than zero

2)is greater than zero

3)is equal to zero

4)takes all the real values

70)On the curve $y = x^3$, the point at which the tangent line is parallel to the chord joining the points (-1, -1) and (2, 8), is

1)(1, -1)

2)(2, 8)

3)(1, 1)

4)(3, 27)

71)If the petrol burnt in driving a motor boat varies as the cube of the velocity, then the speed (in km/hour) of the boat going against a water flow of C kms/hour so that the quantity of petrol burnt is minimum is

1) $\frac{2C}{3}$

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

3) $\frac{4C}{3}$

4) $\frac{3C}{4}$

72)For x < 1, $\int \frac{x-x^2}{\sqrt{1-x}}dx =$

1) $\frac{4}{3}(1-x)^{\frac{3}{2}}-\frac{2}{5}(1-x)^{\frac{5}{2}}-2\sqrt{1-x}+c$

2) $\frac{4}{3}(1-x)^{\frac{3}{2}}-\frac{2}{3}(1-x)^{\frac{5}{2}}-2\sqrt{1-x}+c$

3) $\frac{2}{3}(1-x)^{\frac{3}{2}}-2\sqrt{1-x}+c$

4) $-\frac{2}{15}(1-x)^{\frac{3}{2}}(2+3x)+c$

73) $\int \frac{dx}{(2\sin x+\sec x)^4} = A(1+\tan x)^{-5}+B(1+\tan x)^{-6}+C(1+\tan x)^{-7}+k$, then A + B + C =

1) $\frac{-86}{105}$

2) $\frac{-1}{105}$

3) $\frac{-26}{105}$

4) $\frac{-16}{105}$

74) $\int \frac{2x^2-1+x^2\sqrt{x^2+4}}{x^2\left(x^2+4\right)}dx =$

1) $\frac{9}{8}Tan^{-1}\frac{x}{2}+\frac{1}{4x}+\cosh^{-1}\frac{x}{2}+c$

2) $\frac{9}{8}Tan^{-1}\frac{x}{2}+\frac{1}{4x}+\sinh^{-1}\frac{x}{2}+c$

3) $\frac{9}{16}\log\left|\frac{x+2}{x-2}\right|+\frac{1}{4x}+\log\left|\frac{x+\sqrt{x^2+4}}{2}\right|+c$

4) $\frac{9}{16}\log\left|\frac{2-x}{2+x}\right|+\frac{1}{4x}+\cosh^{-1}\frac{x}{2}+c$

75) For n ≥ 2, let $I_n = \int_0^{\frac{\pi}{4}} \tan^n x dx \; and \; F_n = I_n + I_{n-2}$, then $F_n - F_{n+1} =$

1) $\frac{1}{n}$

2) $\frac{1}{n-1}$

3) $\frac{1}{n(n-1)}$

4) 1+n

76) $\lim_{n\to\infty} n\left[\frac{1}{3n^2+8n+4}+\frac{1}{3n^2+16n+16}+\ldots+\frac{1}{15n^2}\right]=$

1) $\frac{1}{2}\log\frac{9}{5}$

2) $\frac{1}{4}\log\frac{9}{5}$

3) $2\log\frac{9}{5}$

4) $\frac{1}{4}\log\frac{5}{9}$

77) $\int_0^3 \left|x^2 - 3x + 2\right| dx =$

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

2) $\frac{1}{6}$

3) $\frac{11}{6}$

4) $\frac{11}{2}$

78)OABC is a unit square where O is the origin and B =(1, 1). The curves $y^2 = x$ and $x^2 = y$ divide the area of the square into three OABO, OBO and OBCO. If a_1, a_2, a_3 are the areas (in sq. units) of these parts respectively, then $a_1 + 2a_2 + 3a_3 =$

1)1 2)2 3)6 4)64

79)The differential equation corresponding to the family of parabolas $y^2 = 4a(x + a)$, where a is the parameter, is

1) $y\left(\frac{dy}{dx}\right)^2 + 2x\frac{dy}{dx} + y = 0$

2) $y\left(\frac{dy}{dx}\right)^2 - 2x\frac{dy}{dx} - y = 0$

3) $y\left(\frac{dy}{dx}\right)^2 + 2x\left(\frac{dy}{dx}\right) - y = 0$

4) $y = 2x\frac{dy}{dx}$

80)The general solution of $\frac{dy}{dx} + y\tan x = 2x + x^2 \tan x$

1) $y - x^2 = c \sec x$

2) $y \cos x = x^2 \sec x + c$

3) $y \sec x = x^2 + c \cos x$

4) $y = x^2 + c \cos x$

APEAMCET-2018 -- Engineering Stream
Final Key
Date: 22-04-18 AN (Shift 2)

1	1	41	1
2	3	42	4
3	3	43	2
4	1	44	4
5	1	45	3
6	4	46	3
7	2	47	3
8	4	48	4
9	2	49	3
10	2	50	2
11	2	51	1
12	2	52	2
13	1	53	2
14	2	54	1
15	1	55	4
16	3	56	2
17	1	57	4
18	1	58	2
19	1	59	1
20	4	60	3
21	2	61	2
22	2	62	3
23	3	63	2
24	2	64	3
25	1	65	1
26	1	66	4
27	2	67	2
28	3	68	2
29	1	69	1
30	1	70	3
31	3	71	2
32	4	72	4
33	2	73	4
34	3	74	2
35	3	75	3
36	2	76	2
37	1	77	3
38	2	78	2
39	2	79	3
40	4	80	4