If $|x+2| \leq 9$, then x belongs to

(1) $(-\infty, -7)$ (2) $[-11, 7]$ (3) $(-\infty, -7) \cup [11, \infty)$ (4) $(-11, 7)$

$$|x+2| \leq 9$$

$$-9 \leq x+2 \leq 9$$

Add -2 on both sides

$$-11 \leq x \leq 7 \Rightarrow x \in [-11, 7]$$

(2) $[-11, 7]$

Given that x, y and b are real numbers $x < y, b > 0$, then

(1) $xb < yb$ (2) $xb > yb$ (3) $xb \leq yb$ (4) $\frac{x}{b} \geq \frac{y}{b}$

$x < y$

$b > 0$ $bx < by$

(1) $xb < yb$

If $\frac{|x-2|}{x-2} \geq 0$, then x belongs to

(1) $[2, \infty)$ (2) $(2, \infty)$ (3) $(-\infty, 2)$ (4) $(-2, \infty)$

When $x = 2$ f(x) is un defined value so $x \neq 2$

When $x > 2$ f(x) is defined more over $f(x) \geq 0$ Hence $x \in (2, \infty)$

(2) $(2, \infty)$

The solution of $5x - 1 < 24$ and $5x + 1 > -24$ is

(1) $(4, 5)$ (2) $(-5, -4)$ (3) $(-5, 5)$ (4) $(-5, 4)$

$5x-1 < 4$ $5x+1 > -24$

$5x < 25$ $5x > -25$

$x < 5$ $x > -5$

$x \in (-5, 5)$

(3) $(-5, 5)$

The value of $\log_{\sqrt{2}} 512$ is

(1) 16 (2) 18 (3) 9 (4) 12

$$\log_{\sqrt{2}} 512 = x$$

$\Rightarrow 512 = \left(\sqrt{2}\right)^x$

$2^9 = (2)^{\frac{x}{2}}$ Powers are same

$\frac{x}{2} = 9 \Rightarrow x = 18$

(2) 18

The value of $\log_3 \frac{1}{81}$ is

(1) -2 (2) -8 (3) -4 (4) -9

Let $\log_3 \frac{1}{81} = x$

$\Rightarrow \frac{1}{81} = 3^x$ $\Rightarrow \frac{1}{3^4} = 3^x$ $\Rightarrow 3^{-4} = 3^x$

x= -4

(3) -4

If $\log_{\sqrt{x}} 0.25 = 4$, then the value of x is

(1) 0.5 (2) 2.5 (3) 1.5 (4) 1.25

$\left(\sqrt{x}\right)^4 = 0.25$ $\Rightarrow x^2 = 0.5$ $\Rightarrow x = 0.5$

(1) 0.5

The value of $\log_a b \ \log_b c \ \log_c a$ is

(1) 2 (2) 1 (3) 3 (4) 4

By applying change of base rule the value is = 1

(2) 1

If 3 is the logarithm of 343, then the base is

(1) 5 (2) 7 (3) 6 (4) 9

$\log_x 343 = 3$ $\Rightarrow x_3 = 343 = 7_3$ $\Rightarrow x = 3$

(2) 7

Find a so that the sum and product of the roots of the equation $2x^2 + (a-3)x + 3a - 5 = 0$ are equal is

(1) 1 (2) 2 (3) 0 (4) 4

Sum of the roots = $-\left(\frac{a-3}{2}\right)$ Product of the roots = $\frac{3a-5}{2}$

Given that Sum = Product

$$-\left(\frac{a-3}{2}\right) = \frac{3a-5}{2}$$

$\Rightarrow$ -a+3 = 3a-5 $\Rightarrow$ 4a = 8 $\Rightarrow$ a = 2

(2) 2

If a and b are the roots of the equation $x^2 - kx + 16 = 0$ and satisfy $a^2 + b^2 = 32$, then the value of k is

(1) 10 (2) -8 (3) $-8, 8$ (4) 6

Sum of the roots a+b = k Product = 16= ab

$$a^2 + b^2 = (a+b)^2 - 2ab$$

$$a^2 + b^2 = (a+b)^2 - 2ab = 32$$

$\Rightarrow$ k^2-(32) =32

K^2 = 64 $\Rightarrow$ k = ±8

(3) $-8, 8$

The number of solutions of $x^2 + |x-1| = 1$ is

(1) 1 (2) 0 (3) 2 (4) 3

$$x^2 + x - 1 = 1$$

X^2+x-2 =0

(x+2) (x-1) =0

X= 1 (or) x = -2

X^2-x+1 =1

X^2-x=0

X(x-1) = 0 $\Rightarrow$ x = 0 (or) x =1

From this -2 is not satisfies

The number of solutions =2

(3) 2

The equation whose roots are numerically equal but opposite in sign to the roots of $3x^2 - 5x - 7 = 0$ is

(1) $3x^2 - 5x - 7 = 0$ (2) $3x^2 + 5x - 7 = 0$ (3) $3x^2 - 5x + 7 = 0$ (4) $3x^2 + x - 7$

Let one root s are $-\alpha$ and $-\beta$

Sum=- $(\alpha+\beta) = \frac{5}{3}$ $\Rightarrow \alpha+\beta = -\frac{5}{3}$

Product = $(-\alpha)(-\beta) = \alpha\beta = -\frac{7}{3}$

Hence the equation is x^2-(SR)+PR =0

(1) $3x^2 - 5x - 7 = 0$

If 8 and 2 are the roots of $x^2 + ax + c = 0$ and 3, 3 are the roots of $x^2 + dx + b = 0$, then the roots of the equation $x^2 + ax + b = 0$ are

(1) 1, 2 (2) −1, 1 (3) 9, 1 (4) −1, 2

Given that 8 and are the roots of first equation

Sum of the roots = 8+2 = -a $\Rightarrow$ a= -10

Product of the roots (8) (2) = c $\Rightarrow$ c = 16

Given that 3 , 3 are the roots of the second equation

Sum of the roots 3+3 = -d $\Rightarrow$ 6=d

Product of the roots (3) (3) = b $\Rightarrow$ b =9

The equation if $x^2+ax+b=0$

$X^2-10x+9=0 \Rightarrow (x-1)(x-9)=0 \Rightarrow x= 1,9$

(3) 9, 1

If a and b are the real roots of the equation $x^2 - kx + c = 0$, then the distance between the points $(a, 0)$ and $(b, 0)$ is

(1) $\sqrt{k^2 - 4c}$ (2) $\sqrt{4k^2 - c}$ (3) $\sqrt{4c - k^2}$ (4) $\sqrt{k - 8c}$

Sum of the roots = a+b = k and Product of the roots = ab = c

Distance between the points = $\sqrt{(a-b)^2+(0-0)^2}$ = a–b

a – b = $\sqrt{(a+b)^2-4ab} = \sqrt{k^2-4c}$

If $\frac{kx}{(x+2)(x-1)} = \frac{2}{x+2} + \frac{1}{x-1}$, then the value of k is

(1) 1 (2) 2 (3) 3 (4) 4

Kx = 2 (x-1) + (x+2)

Equating co eff of x on both sides we get

K = 2+1 = 3

(3) 3

If $\frac{1-2x}{3+2x-x^2} = \frac{A}{3-x} + \frac{B}{x+1}$, then the value of $A+B$ is

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

1-2x = A (x+1) + b (3-x)

Equating constant terms on both sides we get

1 = A +3B_______(i)

Equating coefficient of x terms on both sides

-2 = A –B -------------(ii)

By solving (i) and (ii) we get A = $-\frac{5}{4}$ B = $\frac{3}{4}$

Hence the value of A+B = $-\frac{5}{4}+\frac{3}{4} = -\frac{2}{4} = -\frac{1}{2}$

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

The number of roots of $(x+3)^4 + (x+5)^4 = 16$ is

(1) 4 (2) 2 (3) 3 (4) 0

The degree of the equation is 4

Hence the number of roots = 4

(1) 4

The value of $\log_3 11 \cdot \log_{11} 13 \cdot \log_{13} 15 \cdot \log_{15} 27 \cdot \log_{27} 81$ is

(1) 1 (2) 2 (3) 3 (4) 4

By applying change of base rule we have

$\log_3 81$

$= \log_3 3^4$

$= 4\log_3 3$

$= 4$

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