Name of the Bundle	Proficient Bundle V1	Subject	Aptitude
Topic	Quadratic Equation	Last updated on	14 October 2024

Multiple Choice Questions on Quadratic equations:

Concept 1(Nature of roots)

A x^2 +BX + C= 0 but a not 0

x=(-b +or- $\sqrt{b^2}$ -4ac)/2a

b^2 -4ac> 0 two real solutions

b^2 -4ac = 0 one real solutions

b^2 -4ac < 0 non real solutions

Concept 2

Sum of the roots (a+b)= -B / A

Product of the roots(ab) =c/a

Concept 3

Minimum value :

We know that for the expression A x^2 +BX + C where a>0 has minimum value at x=-b/2a and its (4ac-b^2)/4a

Maximum value :

we know that for the expression A x^2 +BX + C where a<0 has maximum value at x=-b/2a and its (4ac-b^2)/4a

Name of the Bundle	Proficient Bundle V1	Subject	Aptitude
Topic	Quadratic Equation	Last updated on	14 October 2024

Type: 1 No constant before x^2

1. Solve the quadratic equation: $x^2 - 12x + 32=0$
   a. 4,8
   b. -4,8
   c. 4,-8
   d. -4, -8

Ans: a. 4,8

Explanation:

Method 1:

$x^2 - 8x - 4x + 32 = 0$

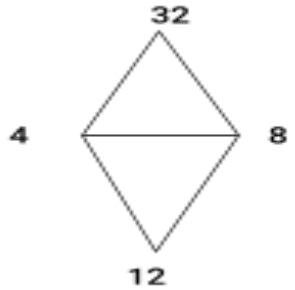
$x(x - 8) - 4(x - 8) = 0$

$(x-8)(x-4) = 0$

$x=4, 8$

Method 2:

- Change the sign of x value in the equation $x^2 - 12x + 32=0 \Rightarrow x^2 + 12x + 32=0$.



Therefore, x=4, 8.

Method 3:

- +, + ⇨ -, -
- -, + ⇨ +, +
- -, - ⇨ +, -
- +, - ⇨ -, +

Here, the equation has -, +. So, the answer will be in +, + (i.e.,) x=4, 8.

Name of the Bundle	Proficient Bundle V1	Subject	Aptitude
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2. Solve the quadratic equation: $x^2 - 8x + 15 = 0$
   a. -3,5
   b. 3,5
   c. 3,-5
   d. -3, -5

Ans: b. 3, 5

Explanation:

Method 1:

$x^2 - 3x - 5x + 15 = 0$

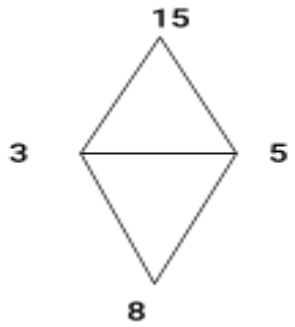
$x(x - 3) - 5(x - 3) = 0$

$(x-3)(x-5) = 0$

$x = 3, 5$

Method 2:

- Change the sign of x value in the equation $x^2 - 8x + 15=0 \Rightarrow x^2 + 8x + 15=0$.



Therefore, x= 3,5.

Method 3:

- +, + ⇨ -, -
- -, + ⇨ +, +
- -, - ⇨ +, -
- +, - ⇨ -, +

Here, the equation has -, +. So, the answer will be in +, + (i.e.,) x=3, 5.

Name of the Bundle	Proficient Bundle V1	Subject	Aptitude
Topic	Quadratic Equation	Last updated on	14 October 2024

3. Solve the equation $x^2 - 3x - 10 = 0$.
   a. 5, 2
   b. -5, -2
   c. 5, -2
   d. -5, 2

Ans: c. 5, -2

Explanation:

Method 1:

$x^2 - 5x + 2x - 10 = 0$

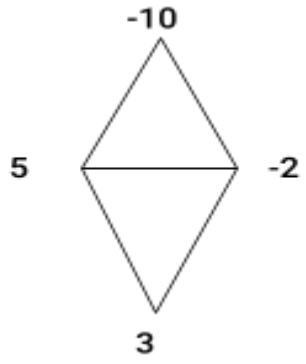
$x(x - 5) + 2(x - 5) = 0$

$(x-5)(x+2) = 0$

$x = 5, -2$

Method 2:

- Change the sign of x value in the equation $x^2 - 3x - 10 = 0 \Rightarrow x^2 + 3x - 10 = 0$.



Therefore, x= 5, -2.

Method 3:

- +, + ⇨ -, -
- -, + ⇨ +, +
- -, - ⇨ +, -
- +, - ⇨ -, +

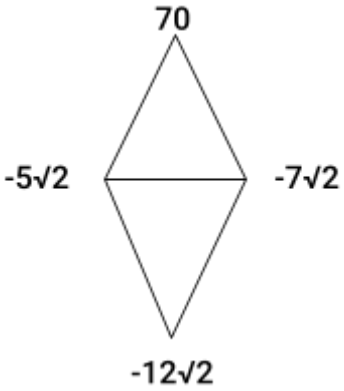
Here, the equation has -, -. So, the answer will be in +,- (i.e.,) x=5, -2.

Name of the Bundle	Proficient Bundle V1	Subject	Aptitude
Topic	Quadratic Equation	Last updated on	14 October 2024

4. Solve the equation $x^2 - 12\sqrt{2}x + 70 = 0$.
   a. $(-7\sqrt{2},-5\sqrt{2})$
   b. $(7\sqrt{2},5\sqrt{2})$
   c. $(-7\sqrt{2},5\sqrt{2})$
   d. $(7\sqrt{2},-5\sqrt{2})$

Ans: a. $(-7\sqrt{2},-5\sqrt{2})$
Explanation:
Method 1:

- Change the sign of x value in the equation $x^2 - 12\sqrt{2}x+70= 0 \Rightarrow x - 12\sqrt{2}x+70 =$



0. Therefore, $x= -7\sqrt{2},-5\sqrt{2}$.

Method 3:

- +, + ⇨ -, -
- -, + ⇨ +, +
- -, - ⇨ +, -
- +, - ⇨ -, +

Here, the equation has -, -. So, the answer will be in +,- (i.e.,) x=5, -2.

Name of the Bundle	Proficient Bundle V1	Subject	Aptitude
Topic	Quadratic Equation	Last updated on	14 October 2024

Type: 2 Constant before x^2

5. Solve the quadratic equation: $3x^2 - 10x + 8 = 0$
   a. -4/3,2
   b. 4/3,2
   c. 4/3,-2
   d. -4/3, -2

Ans: b. 4/3,2

Explanation:

Method 1:

$3x^2 - 10x + 8 = 0 \Rightarrow 3x^2 - 6x - 4x + 8 = 0$

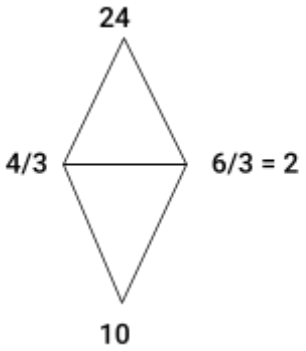
$3x(x - 2) - 4(x - 2) = 0$

$(3x-4)(x-2) = 0$

x= 4/3,2

Method 2:

- Change the sign of x value in the equation $3x^2 - 10x + 8 = 0 \Rightarrow 3x^2 + 10x + 8 = 0$.



Therefore, x= 4/3,2.

Method 3:

- +, + ⇨ -, -
- -, + ⇨ +, +
- -, - ⇨ +, -
- +, - ⇨ -, +

Here, the equation has -, +. So, the answer will be in +,+(i.e.,) x=4/3,2.

Name of the Bundle	Proficient Bundle V1	Subject	Aptitude
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6. Solve the equation $2x^2 + 8x + 6 = 0$.
   a. 1, 3
   b. -1, 3
   c. 1, -3
   d. -1, -3

Ans: d. -1, -3

Explanation:

Method 1:

$2x^2 + 8x + 6 = 0 \Rightarrow 2x^2 + 2x + 6x + 6 = 0$

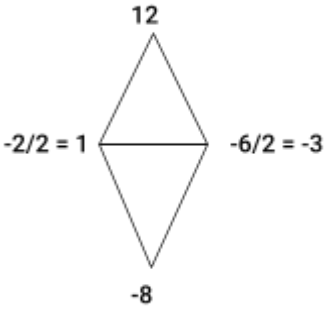
$2x(x + 1) + 6(x + 1) = 0$

$(x+1)(2x+6) = 0$

$x = -1, -3$

Method 2:

- Change the sign of x value in the equation $2x^2 + 8x + 6 = 0 \Rightarrow 2x^2 - 8x + 6 = 0$



Therefore, x= -1, -3.

Method 3:

- +, + ⇨ -, -
- -, + ⇨ +, +
- -, - ⇨ +, -
- +, - ⇨ -(big number), +

Here, the equation has +, +. So, the answer will be in -,-(i.e.,) x= -1, -3.

Name of the Bundle	Proficient Bundle V1	Subject	Aptitude
Topic	Quadratic Equation	Last updated on	14 October 2024

7. Solve the quadratic equation: $3x^2 + 3x - 18 = 0$
   a. 3, 2
   b. -3, -2
   c. -3, 2
   d. 3, -2

Ans: c. -3, 2

Explanation:

Method 1:

$3x^2 + 3x - 18 = 0 \Rightarrow 3x^2 + 9x - 6x - 18 = 0$

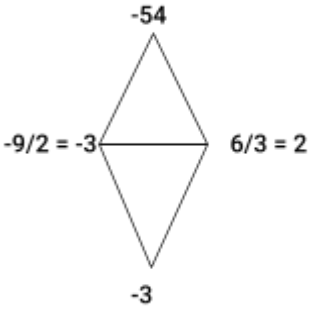
$3x(x + 3) - 6(x + 3) = 0$

$(x+3)(3x-6) = 0$

$x = -3, 2$

Method 2:

- Change the sign of x value in the equation $3x^2 + 3x - 18 = 0 \Rightarrow 3x^2 - 3x - 18 = 0$.



Therefore, x= -3, 2.

Method 3:

- +, + ⇨ -, -
- -, + ⇨ +, +
- -, - ⇨ +, -
- +, - ⇨ -(big number), +

Here, the equation has +, -. So, the answer will be in -(big number), + (i.e.,) x=-1,-3.

Name of the Bundle	Proficient Bundle V1	Subject	Aptitude
Topic	Quadratic Equation	Last updated on	14 October 2024

8. Find the quadratic equation whose roots are 5 and 8.
   a. $x^2 - 13x + 40 = 0$
   b. $x^2 - 13x - 40 = 0$
   c. $x^2 + 13x + 40 = 0$
   d. $x^2 - 13x - 40 = 0$

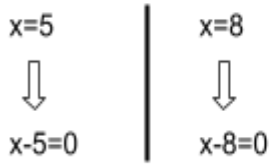
Ans: a. $x^2 - 13x + 40 = 0$

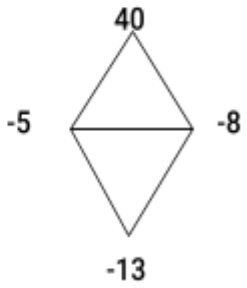
Explanation:

Method 1:

Here, the roots are in +, + form. So, the equation will be in -, +.

Method 2:





So, the equation will be $x^2 - 13x + 40 = 0$.

Name of the Bundle	Proficient Bundle V1	Subject	Aptitude
Topic	Quadratic Equation	Last updated on	14 October 2024

9. Solve the quadratic equation: $x^2 - 6x + 4 = 0$
   a. x= - 3+√5, 3-√5
   b. x= 3+√5, 3-√5
   c. x= 3-√5, 3-√5
   d. x= 3+√5, 3+5

Ans: b. x= 3+√5, 3-√5

Explanation:

Method 1:

$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$$

$$= \frac{-(-6) \pm \sqrt{36-4(1)(4)}}{2(1)}$$

$$= \frac{6 \pm \sqrt{36-16}}{2} = \frac{6 \pm \sqrt{20}}{2}$$

$$= \frac{6 \pm 2\sqrt{5}}{2}$$

$$= \frac{3+\sqrt{5}}{2} \text{ or } \frac{3-\sqrt{5}}{2}$$

Method 2:

- +, + ⇨ -, -
- -, + ⇨ +, +
- -, - ⇨ +, -
- +, - ⇨ -, +

Here, the equation has -, +.So, the answer will be in +, + (i.e.,) x=3+√5 , 3-√5.

Name of the Bundle	Proficient Bundle V1	Subject	Aptitude
Topic	Quadratic Equation	Last updated on	14 October 2024

10. Solve the quadratic equation: $x^2 + 6x + 18 = 0$
    a. -3+3i, -3-3i
    b. -3+3i, 3+3i
    c. 3+3i, 3+3i
    d. 3+3i, -3+3i

Ans: a. -3+3i, -3-3i
Explanation:
Method 1:

$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$$

$$= \frac{-(6) \pm \sqrt{36-4(1)(18)}}{2(1)}$$

$$= \frac{-6 \pm \sqrt{36-72}}{2} = \frac{-6 \pm \sqrt{36i}}{2}$$

$$= \frac{-6 \pm 6i}{2}$$

$$= \frac{-3+3i}{2} \text{ or } \frac{-3-3i}{2}$$

Method 2:

- +, + ⇨ -, -
- -, + ⇨ +, +
- -, - ⇨ +, -
- +, - ⇨ -, +

Here, the equation has +, + .So, the answer will be in -, - (i.e.,) x=-3+3i, -3-3i.

Name of the Bundle	Proficient Bundle V1	Subject	Aptitude
Topic	Quadratic Equation	Last updated on	14 October 2024

11. Find the sum of the root and the product of the roots of: $3x^2 + 5x + 9 = 0$
    a. 5/3,3
    b. 3/5,1/3
    c. -5/3,-3
    d. -5/3,3

Ans: d. -5/3,3
Explanation:

$3x^2 + 5x + 9 = 0 \Rightarrow a= 3, b= 5, c=9$

i) Sum of Root= $-b/a \Rightarrow -5/3$

ii) Product of Root= $c/a \Rightarrow 9/3=3$

12. Find the sum of the root and the product of the roots of: $5x^2 -24 = 0$
    a. 0,24/5
    b. 0,- 24/5
    c. 0,-5/3
    d. 0,5/3

Ans: b. 0,- 24/5
Explanation:

$5x^2 -24 = 0 \Rightarrow a= 5, b= 0, c=-24$

i) Sum of Root= $-b/a \Rightarrow 0/5 =0$

ii) Product of Root= $c/a \Rightarrow -24/5$

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Topic	Quadratic Equation	Last updated on	14 October 2024

13. Find the value of k, in the quadratic equation $4x^2 - 8x + k = 0$, if one root is 3 times the other root.
    a. 5
    b. 3
    c. -5
    d. -3

Ans: b. 3

Explanation:

Let one root be a, other root 3a.

i) Sum of Root= -b/a $\Rightarrow$ a+3a = 8/4 = 2

$\Rightarrow$4a=2 $\Rightarrow$ a=1/2

ii) Product of Root= c/a $\Rightarrow$ (a)(3a) = k/4 $\Rightarrow$ $3a^2 = k/4$

$\Rightarrow$ 3(1/4) = k/4 $\Rightarrow$ k= 3

14. If the roots of $x^2 + kx + 121 = 0$ are non-real, find the values of k.
    a. -22<=k<=22
    b. -11<=k<=11
    c. -12<=k<=12
    d. -33<=k<=33

Ans: a. -22<=k<=22

Explanation:

$b^2 - 4ac < 0$ non real solutions

$k^2 - 4x121<0$

$k^2 <484$

-22<=k<=22

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15. Find the minimum value of the expression $5x^2+9x+12$. Also find the value of x, where the expression is minimum.
    a. 159/20, 9/10
    b. -159/20, 9/10
    c. -159/20, -9/10
    d. 159/20, -9/10

Ans: d. 159/20, -9/10

Explanation:

Minimum value :

We know that for the expression A x^2 +BX + C where a>0 has minimum value at

x=-b/2a and its $(4ac-b^2)/4a$

minimum value = $4(12)(5)-(9)^2/4X5$ =159/10

minimum value at x =-9/10

16. Find the minimum value of the expression $7x-8x^2-17$.
    a. 451/32
    b. 495/32
    c. -451/32
    d. -495/32

Ans: d. -495/32

Explanation:

Maximum value :

We know that for the expression A x^2 +BX + C where a<0 has minimum value at x=-b/2a and its $(4ac-b^2)/4a$

maximum value = $4(-17)(-8)-(7)^2/4X-8$

=-495/32

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Topic	Quadratic Equation	Last updated on	14 October 2024

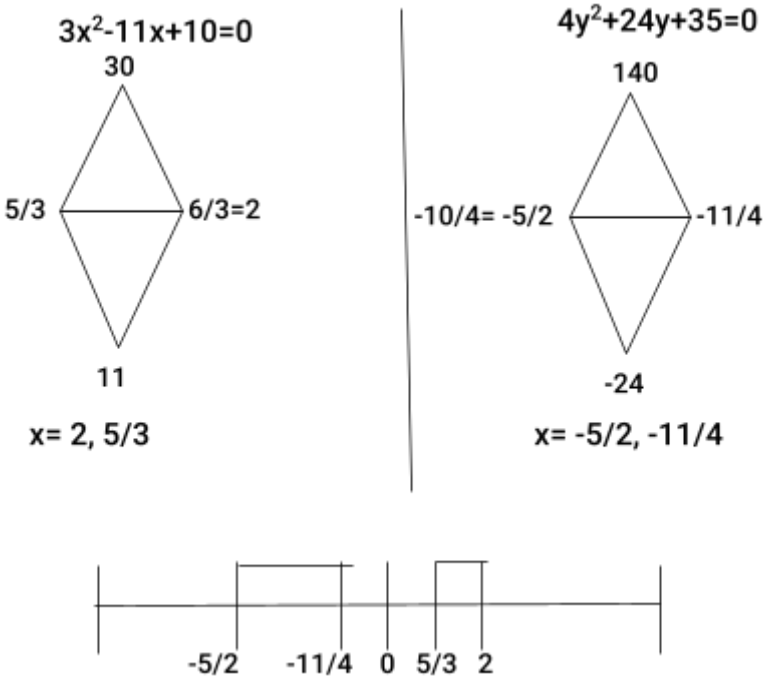
17. Find the relation between the following two equations.

i) $3x^2-11x+10=0$.

ii) $4y^2+24y+35=0$.

a. x>y
b. x>=y
c. x<y
d. x<=y

Ans: a. x>y
Explanation:



The value of x is greater than y. So, X>Y

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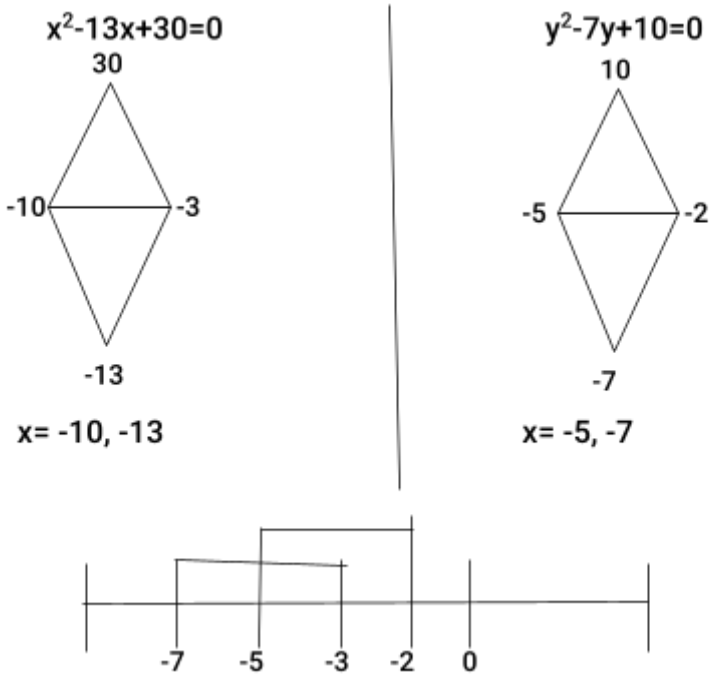
18. Find the relation between the following two equations.

i) $x^2+13x+30=0$.

ii) $y^2+7y+10=0$.

a. X>Y
b. X>=Y
c. X<Y
d. Cannot be determined

Ans: d. Cannot be determined
Explanation:



The values of x and y are big and small. So, the values cannot be determined.