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**Topic: Solution To Quardratic Equation**

**Solved Examples:**

**Problem 1:** Solve for x: x2-3x-10 = 0

Solution:

Let us express -3x as a sum of -5x and +2x.

→ x2-5x+2x-10 = 0

→ x(x-5)+2(x-5) = 0

→ (x-5)(x+2) = 0

→ x-5 = 0        or         x+2 = 0

→ x = 5           or         x = -2

**Problem 2:** Solve for x: x2-18x+45 = 0

Solution:

The numbers which add up to -18 and give +45 when multiplied are -15 and -3.

Rewriting the equation,

→ x2-15x-3x+45 = 0

→ x(x-15)-3(x-15) = 0

→ (x-15) (x-3) = 0

→ x-15 = 0      or         x-3 = 0

→ x = 15         or         x = 3

**Problem 3:** Solve for x: 3x2+2x =1

Solution:

Rewriting our equation, we get 3x2+2x-1= 0

Here, the coefficient of x2 is 3. In these cases, we multiply the constant c with the coefficient of x2. Therefore, the product of the numbers we choose should be equal to -3 (-1\*3).

Expressing 2x as a sum of +3x and –x

→ 3x2+3x-x-1 = 0

→ 3x(x+1)-1(x+1) = 0

→ (3x-1)(x+1) = 0

→ 3x-1 = 0      or         x+1 = 0

→ x = 1/3        or         x = -1

**Problem 4:** Solve for x: 11x2+18x+7 = 0

Solution:

In this case, the sum of the numbers we choose should equal to 18 and the product of the numbers should equal 11\*7 = 77.

This can be done by expressing 18x as the sum of 11x and 7x.

→ 11x2+11x+7x+7 = 0

→ 11x(x+1) +7(x+1) = 0

→ (x+1)(11x+7) = 0

→ x+1 = 0       or         11x+7 = 0

→ x = -1          or         x = -7/11.

**Practice Questions:**

**Q: Solve the following algebraic equations to find the values of the variables.**

**[HINT: Apply the methods of factorization where it is required, then apply either and or to find the values of unknowns]**

1. 6x (x + 3) = 0
2. 3x2 – 11x + 8 = 0
3. 4x2 – 9 = 0
4. x2 – 3x + 18 = 0
5. (2x + 7) (x – 5) = 0
6. 3c (c – 5) = 0
7. -7e (9e – 4) =0
8. (6 – 5d) (15 + 11d) = 0
9. – 8f – 16f2 = 0
10. 2c2 + 7c – 4 = 0
11. 12d2 – d – 6 = 0
12. 25 m2  – 16 = 0
13. 49y2 – 81 = 0