Quadratic Equations

Questions are generally asked in the format of two equations, where we have to find equality of the roots in the two equations.

$$x^2 + ax + b = 0$$

$$y^2 + cx + d = 0$$

Then two roots of both equations that is X_1, X_2 and Y_1, Y_2 are compared to determine if:

- X>Y
- X<Y
- X≤Y
- X≥Y
- No relation or X=Y

How to solve:

Don’t solve it conventionally

For $kx^2 + ax + b = 0$ type of equations:

1. Product of k and b
2. Find two numbers which on addition give a and their product is b.
3. Since there is a positive sign before a the two roots will have negative sign.

Ex: $3x^2 + 7x + 4=0$

- 3×4=12
- 3 + 4 =7
- So roots are -3/3 = -1 and -4/3 = -1.33
- We have divided by 3 because the coefficient of x^2 is 3

For $kx^2 - ax + b = 0$ type of equations:

- Product of b and k
- Addition of two numbers to give a which give product b
- Since there is a negative sign before coefficient of x; the two roots will have positive sign.

Ex: $3x^2 - 7x + 4 = 0$

- 3×4=12
- 3 + 4 = 7
- So roots are -3/3= -1 and -4/3 = -1.33

For $kx^2 + ax - b = 0$ type of equations:

- Product of [-b] and k
- Find two numbers which on subtraction give a and their product is [-bk]
- Now while assigning signs to the roots the bigger number will get a negative sign, because the middle term of equation has positive sign (+).

Ex: $2x^2 + 7x - 4 = 0$

- -4 × 2 = -8
- Which gives 8 and 1 as [8-1=7] and [8×1=8] {not considering sign just now}
- Since 8 > 1, so we get [-8/2 = -4] and [1/2 = 0.5]

For $kx^2 - ax - b = 0$ type of equations:

- Product of [-b] and k
- Find two numbers which on subtraction gives [-a] and their product is [-bk]

- While assigning signs to roots the bigger root will get a positive sign, because the middle term is negative.

Ex: $x^2-x-6=0$:

- $-6 \times 1 = -6$
- Which gives 3 and 2 as the roots; [3-2=1] and [$3 \times 2 = 6$] {Not considering sign just now}
- Out of 3 and 2; 3 will get the positive sign since the middle term is negative.