Points to Remember

- **If numerator > denominator, the answer will be greater than 1.**

- **If numerator < denominator, the answer will be less than 1.**

Example : 8/7 will be greater than 7/8

This is because,

$8/7 > 1$, where $7/8 < 1$.

- If Column A is $5\sqrt{25}$ and

  Column B is $\sqrt{620}$

How to find this, its simple (square the values)

Column A	Column B
$(5^2)(25)$	620
625	620

Therefore, column A is greater.

- **X% of Y is equal to Y% of X**

For example :

→ 20% of 5 is equal to 5% of 20

→ 122% of 15 = 15% of 122

→ $16\frac{2}{3}$% of 40 = 40% of $16\frac{2}{3}$

Find the S.D for 1 ,1, 1, 1 .... or a series of same numbers.

S.D for a series of same numbers is "Zero".

This is because, there is no deviation between numbers.

- For example : If Column A is 1/2+5/3+21/5+1/8 and

  Column B is 21/5+1/3+1/8

Instead of taking L.C.M and solving

First look at the numbers and find whether column A and Column B have same numbers.

If yes eliminate those numbers.

Then,

Column A	Column B
1/2+5/3	1/3

Now its simpler to solve

If n is a positive integer, then

$$n^{(n+1)} > (n + 1)^n \text{ , for } n > 3$$

For Example : Column A → $18^{17}/17^{18}$

Column B → $17^{18}/18^{17}$

column A	Column B
$18^{17}/17^{18}$	$17^{18} / 18^{17}$
Numerator < Denominator	Numerator > Denominator
Hence $18^{17}/17^{18} < 1$	Hence $17^{18} / 18^{17} > 1$

Hence B is the choice.

Important Formulae

1. $(x + y)^2 = x^2 + 2xy + y^2$
2. $(x - y)^2 = x^2 - 2xy + y^2$
3. $(x + y)^3 = x^3 + 3x^2y + 3xy^2 + y^3$
4. $(x - y)^3 = x^3 - 3x^2y + 3xy^2 - y^3$
5. $x^2 - y^2 = (x + y)(x - y)$
6. $x^3 - y^3 = (x - y)(x^2 + xy + y^2)$
7. $x^3 + y^3 = (x + y)(x^2 - xy + y^2)$

Points to remember

- If a quadratic equation is given in the question,

  say $ax^2+bx+c=0$

  and the option given is $(px - r_1)(qx - r_2)$

Then, check if $a = (pq)$, $b = (qr_1 + pr_2)$ and $c = (r_1 r_2)$

Note 1 : consider sign for r_1, r_2 and r_3

- Likewise for a cubic equation

  $ax^3 - bx^2 + cx - d = 0$,

  the option given is $(px-r_1)(qx-r_2)(sx-r_3)$

Then,check if $a = (pqs)$, $b = (qsr_1 + psr_2 + pqr_3)$, $d = (r_1r_2r_3)$

<u>Note 1</u> : consider sign for r_1,$r_2$and r_3

Example 1 : $12x^2 + 2x – 2$

Options (i) $(4x – 2)(3x+1)$

(ii) $(4x + 2)(3x-1)$

(iii) $(12x – 3)(x+1)$

(iv) $(4x – 1)(3x+1)$

Solution :

$a = 12$, $b = 2$, $c = -2$

First lets find, which options will give us the value of c, when their constants are multiplied.($c = - 2$)

option (i) it is $(-2)(+1) = -2$; option (ii) it is $(+2)(-1) = -2$

option (iii) it is $(-3)(+1) = -3$; option (iv) it is $(-1)(+1) = -1$

From this we can eliminate , option (iii) and option (iv)

Now lets find, which option satisfies the value of a (a = 12)

a = (pq)

Option 1 : a = (4)(3) = 12

Option 2 : a = (4)(3) = 12

Here , we cannot eliminate any option because both the options satisfies the condition.

Lets check, for the value of b (b= 2)

b = (qr_1 + pr_2)

Option 1 : b = [(3)(-2) + (4)(1)] = -6 +4 = -2

Option 2 : b = [(3)(2) + (4)(-1)] = 6 – 4 = 2

Therefore option 1 is eliminated.

Hence, answer is option 2

Example 2 : $x^3 + 6x^2 + 11x + 6$

option (i) $(x+1)(x+2)(x+3)$

(ii) $(2x+3)(x+3)^2$

(iii) $(x-1)(x-2)(x+3)$

(iv) $(x-1)(x-2)(x-3)$

Solution : Product of the constants must be equal to +6

option (i) it is +6 ; option (ii) it is +27 ; option (iii) it is +6

option (iv) it is -6

Hence we can eliminate option (ii) and option (iv)

Now lets check for b = $(qsr_1 + psr_2 + pqr_3)$

b must be equal to + 6

Option 1 : b= +6

Option 2 : b = 0

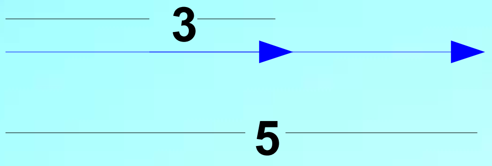
Hence, eliminating the option (iii), the answer for this question is option (i)

- Given one triangle whose arms are 3 and 5. If its angles are less than 90, then find the range of other arm?

Solution:

If θ is the angle between the sides of length 3 and 5.

The range of θ is 0° - 90°



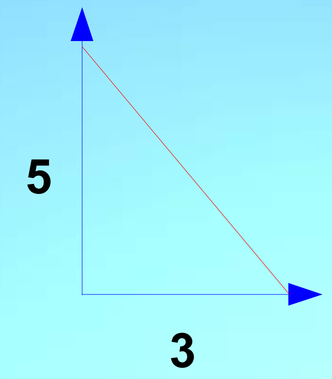
If the angle is 0º

If the angle the two arms is 0°, then the length of the third arm is (5- 3) = 2.

If the angle the two arms is 90°,

then the length of the third arm

(by hypotenuse theorem) is $\sqrt{(5^2 + 3^2)} = \sqrt{34}$



If the angle is 90º

Hence the range of third side is 2 to $\sqrt{34}$.