

**EXERCISE 12(B)**

**1. If x, y and z are in continued proportion, then which of the following is true:**

- (i)  $x: y = x: z$
- (ii)  $x: x = z: y$
- (iii)  $x: y = y: z$
- (iv)  $y: x = y: z$

**Solution:**

Here option (iii) is in continued proportion i.e.  $x: y = y: z$

**2. Which of the following numbers are in continued proportion:**

- (i) 3, 6 and 15
- (ii) 15, 45 and 48
- (iii) 6, 12 and 24
- (iv) 12, 18 and 27

**Solution:**

Here options (iii) and (iv) are in continued proportion

(iii)  $6 / 12 = 12 / 24$

$1 / 2 = 1 / 2$

(iv)  $12 / 18 = 18 / 27$

$2 / 3 = 2 / 3$

Therefore (iii) and (iv) are in continued proportion

**3. Find the mean proportion between**

- (i) 3 and 27
- (ii) 0.06 and 0.96

**Solution:**

- (i) 3 and 27

The mean proportion between 3 and 27 can be calculated as below

Mean proportion =  $\sqrt{3 \times 27}$

=  $\sqrt{81}$

= 9

Therefore mean proportion between 3 and 27 is 9

- (ii) 0.06 and 0.96

The mean proportion between 0.06 and 0.96 can be calculated as below

Mean proportion =  $\sqrt{0.06 \times 0.96}$

=  $\sqrt{0.0576}$

= 0.24

Therefore the mean proportion between 0.06 and 0.96 is 0.24

**4. Find the third proportional to:**

(i) 36, 18

(ii) 5.25, 7

(iii) Rs 1. 60, Rs 0.40

**Solution:**

(i) 36, 18

Let the required third proportional be  $x$

Hence, 36, 18,  $x$  are in continued proportion

$$\Rightarrow 36: 18 = 18: x$$

$$\Rightarrow 36x = 18 \times 18$$

$$\Rightarrow x = (18 \times 18) / 36$$

$$\Rightarrow x = 324 / 36$$

$$\Rightarrow x = 9$$

Therefore the required third proportional is 9

(ii) 5.25, 7

Let the required third proportional be  $x$

Hence 5.25, 7,  $x$  are in continued proportion

$$\Rightarrow 5.25: 7 = 7: x$$

$$\Rightarrow 5.25x = 7 \times 7$$

$$\Rightarrow x = (7 \times 7) / 5.25$$

$$\Rightarrow x = 49 / 5.25$$

$$\Rightarrow x = 28 / 3$$

$$\Rightarrow x = 9\frac{1}{3}$$

Therefore the required third proportional is  $9\frac{1}{3}$

(iii) Rs 1.60, Rs 0.40

Let the required third proportional be  $x$

Hence Rs 1.60, 0.40,  $x$  are in continued proportion

$$\Rightarrow 1.60: 0.40 = 0.40: x$$

$$\Rightarrow 1.60 \times x = 0.40 \times 0.40$$

$$\Rightarrow x = (0.40 \times 0.40) / 1.60$$

$$\Rightarrow x = 0.1$$

Therefore required third proportional is 0.1

**5. The ratio between 7 and 5 is same as the ratio between Rs  $x$  and Rs 20.50; find the value of  $x$**

**Solution:**

Given

Ratio between 7 and 5 is same as the ratio between Rs x and Rs 20.50

Hence, the value of x can be calculated as below

$$7: 5 = x: 20.50$$

$$5x = 7 \times 20.50$$

$$x = (7 \times 20.50) / 5$$

$$x = (143.5) / 5$$

$$x = 28.7$$

Therefore the value of x is 28.7

**6. If  $(4x + 3y): (3x + 5y) = 6: 7$ , find:**

**(i) x: y**

**(ii) x, if y = 10**

**(iii) y, if x = 27**

**Solution:**

**(i) x: y**

Given

$$(4x + 3y): (3x + 5y) = 6: 7$$

We can calculate x: y as below

$$7(4x + 3y) = 6(3x + 5y)$$

$$28x + 21y = 18x + 30y$$

$$28x - 18x = 30y - 21y$$

$$10x = 9y$$

$$x / y = 9 / 10$$

Therefore x: y is 9: 10

**(ii) x, if y = 10**

Given

$$(4x + 3y): (3x + 5y) = 6: 7$$

And y = 10

Hence we can calculate x as below

$$7(4x + 3 \times 10) = 6(3x + 5 \times 10)$$

$$7(4x + 30) = 6(3x + 50)$$

$$28x + 210 = 18x + 300$$

$$28x - 18x = 300 - 210$$

$$10x = 90$$

$$x = 90 / 10$$

$$x = 9$$

Therefore the value of x is 9

**(iii) y, if x = 27**

Given

$$(4x + 3y) : (3x + 5y) = 6 : 7$$

And  $x = 27$

We can calculate  $x$  as below

$$7(4 \times 27 + 3y) = 6(3 \times 27 + 5y)$$

$$7(108 + 21y) = 6(81 + 5y)$$

$$756 + 21y = 486 + 30y$$

$$9y = 756 - 486$$

$$9y = 270$$

$$y = 270 / 9$$

$$y = 30$$

Therefore the value of  $y$  is 30

7. If  $(2y + 5x) / (3y - 5x) = 2\frac{1}{2}$ , find:

(i)  $x : y$

(ii)  $x$ , if  $y = 70$

(iii)  $y$ , if  $x = 33$

**Solution:**

(i)  $x : y$

Given

$$(2y + 5x) / (3y - 5x) = 2\frac{1}{2}$$

Hence  $x : y$  can be calculated as below

$$(2y + 5x) / (3y - 5x) = 2\frac{1}{2}$$

We get

$$(2y + 5x) / (3y - 5x) = 5 / 2$$

$$2[(2y + 5x)] = 5[(3y - 5x)]$$

$$4y + 10x = 15y - 25x$$

$$25x + 10x = 15y - 4y$$

$$35x = 11y$$

$$x / y = 11 / 35$$

$$x : y = 11 : 35$$

Therefore  $x : y$  is 11 : 35

(ii)  $x$ , if  $y = 70$

Given

$$(2y + 5x) / (3y - 5x) = 2\frac{1}{2}$$

And  $y = 70$

Hence  $x$  can be calculated as below

$$(2 \times 70 + 5x) / (3 \times 70 - 5x) = 2\frac{1}{2}$$

On calculating further, we get

$$(2 \times 70 + 5x) / (3 \times 70 - 5x) = 5 / 2$$

$$2 [140 + 5x] = 5 [210 - 5x]$$

$$280 + 10x = 1050 - 25x$$

$$25x + 10x = 1050 - 280$$

$$35x = 770$$

$$x = 770 / 35$$

$$x = 22$$

Therefore x is 22

(iii) y, if x = 33

Given

$$(2y + 5x) / (3y - 5x) = 2\frac{1}{2}$$

And x = 33

Hence y can be calculated as below

$$(2y + 5 \times 33) / (3y - 5 \times 33) = 2\frac{1}{2}$$

$$(2y + 5 \times 33) / (3y - 5 \times 33) = 5 / 2$$

$$2 [(2y + 165)] = 5 [(3y - 165)]$$

$$4y + 330 = 15y - 825$$

$$11y = 1155$$

$$y = 1155 / 11$$

$$y = 105$$

Therefore y is 105