



# VIDYA BHAWAN, BALIKA VIDYAPITH

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(Affiliated to CBSE up to +2 Level)

CLASS: X

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SUB.: MATHEMATICS

## Do Your Self

4. A fraction becomes  $\frac{1}{3}$  when 1 is subtracted from its numerator and it becomes  $\frac{1}{4}$  when 8 is added to its denominator. Find the fraction.

(a)  $\frac{4}{12}$

(b)  $\frac{3}{13}$

(c)  $\frac{5}{12}$

(d)  $\frac{11}{7}$

let the fraction is  $\frac{x}{y}$

According to the given condition,

A fraction becomes  $\frac{1}{3}$  when 1 is subtracted from its numerator.

$$\text{So, } \frac{x-1}{y} = \frac{1}{3}$$

$$3x - 3 = y$$

$$3x - y = 3 \text{ _____ (i)}$$

The fraction becomes  $\frac{1}{4}$  when 8 is added to its denominator.

$$\text{So, } \frac{x}{y+8} = \frac{1}{4}$$

$$4x = y + 8$$

$$4x - y = 8 \text{ _____ (ii)}$$

Solving equation (i) and (ii) we get :

$$x = 5 \text{ \& } y = 12$$

$$\text{So, the fraction is } \frac{x}{y} = \frac{5}{12}$$

5. Five years ago, A was thrice as old as B and ten years later, A shall be twice as old as B. What is the present age of A.

(a) 20

(b) 50

(c) 60

(d) 40

Assume that present age of A as x and that of B as y.

Five years ago, A was thrice as old as B

i.e. age of a was  $x - 5$  and age of b was  $3(y-5)$

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

$$x - 5 = 3y - 15$$

$$x - 3y = -15 + 5$$

$$x - 3y = -10 \text{ -----(1)}$$

Ten years later ,A shall be twice as old as B

i.e. age of A will be  $x + 10$  and age of B will be  $2(y+10)$

$$x + 10 = 2(y + 10)$$

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$$x + 10 = 2y + 20$$

$$x - 2y = 20 - 10$$

$$x - 2y = 10 \text{ -----(2)}$$

By elimination method, we get

$$x - 3y = -10$$

$$x - 2y = 10$$

$$-y = -20$$

$y = 20$  i.e. present age of B

Substituting  $y = 20$  in equation 1, we get

$$x - 3y = -10$$

$$x - 3(20) = -10$$

$$x - 60 = -10$$

$$x = -10 + 60$$

$$x = 50$$

the present age of A = 50 Years

6. What will be the solution of these equations  $ax+by=a-b$ ,  $bx-ay=a+b$

(a)  $x=1, y=2$

(b)  $x=2, y=-2$

(c)  $x=-2, y=-2$

(d)  $x=1, y=-1$

7. If  $x=a, y=b$  is the solution of the pair of equation  $x-y=2$  and  $x+y=4$  then what will be value of a and b

(a) 2,1

(b) 3,1

(c) 4,6

(d) 1,2

8. Rozly can row downstream 20km in 2 hours, and the upstream 4km in 2 hours. What will be the speed of rowing in still water?

(a) 6km/hr

(b) 4km/hr

(c) 3km/hr

(d) 7km/hr

Let the speed of the boat in still water be  $x$  km/h, and that of the current be  $y$  km/h.

Therefore,

speed downstream would be  $x + y$  km/h and

speed upstream would be  $x - y$  km/h.

According to the question,

On further simplification

$$x + y = 10 \text{ and } x - y = 2.$$

On solving these equations, we get  $x = 6$  and  $y = 4$ .

Therefore,

the speed of the boat in still water is 6 km/h and

the speed of the current is 4 km/h.

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