EXERCISE 2.6

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Solve the following equations.

1. (8x – 3)/3x = 2

Solution:

(8x – 3)/3x = 2

⇒ 8x/3x – 3/3x = 2

⇒ 8/3 – 1/x = 2

⇒ 8/3 – 2 = 1/x

⇒ (8 – 6)/3 = 1/x

⇒ 2/3 = 1/x

⇒ x = 3/2

2. 9x/(7 – 6x) = 15

Solution:

9x/(7 – 6x) = 15

⇒ 9x = 15(7 – 6x)

⇒ 9x = 105 – 90x

⇒ 9x + 90x = 105

⇒ 99x = 105

⇒ x = 105/99 = 35/33

3. z/(z + 15) = 4/9

Solution:

z/(z + 15) = 4/9

⇒ z = 4/9 (z + 15)

⇒ 9z = 4(z + 15)

⇒ 9z = 4z + 60

⇒ 9z – 4z = 60

⇒ 5z = 60

⇒ z = 12

4. (3y + 4)/(2 – 6y) = -2/5

Solution:

(3y + 4)/(2 – 6y) = -2/5

⇒ 3y + 4 = -2/5 (2 – 6y)

⇒ 5(3y + 4) = -2(2 – 6y)

⇒ 15y + 20 = -4 + 12y

⇒ 15y – 12y = -4 – 20

⇒ 3y = -24

⇒ y = -8

5. (7y + 4)/(y + 2) = -4/3

Solution:

(7y + 4)/(y + 2) = -4/3

⇒ 7y + 4 = -4/3 (y + 2)

⇒ 3(7y + 4) = -4(y + 2)

⇒ 21y + 12 = -4y – 8

⇒ 21y + 4y = -8 – 12

⇒ 25y = -20

⇒ y = -20/25 = -4/5

6. The ages of Hari and Harry are in the ratio of 5:7. Four years from now, the ratio of their ages will be 3:4. Find their present ages.

Solution:

Let the age of Hari be 5x and Harry be 7x. 4 years later,

Age of Hari = 5x + 4

Age of Harry = 7x + 4

According to the question,

$(5x + 4)/(7x + 4) = ¾$

$\Rightarrow 4(5x + 4) = 3(7x + 4)$

$\Rightarrow 20x + 16 = 21x + 12$

$\Rightarrow 21x – 20x = 16 – 12$

$\Rightarrow x = 4$

Hari's age = $5x = 5 \times 4 = 20$ years

Harry's age = $7x = 7 \times 4 = 28$ years

7. The denominator of a rational number is greater than its numerator by 8. If the numerator is increased by 17 and the denominator is decreased by 1, the number obtained is 3/2. Find the rational number.

Solution:

Let the numerator be x, then the denominator will be (x + 8)

According to the question,

$(x + 17)/(x + 8 – 1) = 3/2$

$\Rightarrow (x + 17)/(x + 7) = 3/2$

$\Rightarrow 2(x + 17) = 3(x + 7)$

$\Rightarrow 2x + 34 = 3x + 21$

$\Rightarrow 34 – 21 = 3x – 2x$

$\Rightarrow 13 = x$

The rational number is $x/(x + 8) = 13/21$