

Mathematics

(Chapter – 4) (Simple Equations) (Class – VII)

Exercise 4.1

Question 1:

Complete the last column of the table:

S. No.	Equation	Value	Say, whether the Equation is satisfied. (Yes / No)
(i)	$x+3=0$	$x=3$	
(ii)	$x+3=0$	$x=0$	
(iii)	$x+3=0$	$x=-3$	
(iv)	$x-7=1$	$x=7$	
(v)	$x-7=1$	$x=8$	
(vi)	$5x=25$	$x=0$	
(vii)	$5x=25$	$x=5$	
(viii)	$5x=25$	$x=-5$	
(viii)	$\frac{m}{3}=2$	$m=-6$	
(ix)	$\frac{m}{3}=2$	$m=0$	
(x)	$\frac{m}{3}=2$	$m=6$	

Answer 1:

S. No.	Equation	Value	Say, whether the Equation is satisfied. (Yes / No)
(i)	$x+3=0$	$x=3$	No
(ii)	$x+3=0$	$x=0$	No
(iii)	$x+3=0$	$x=-3$	Yes
(iv)	$x-7=1$	$x=7$	No
(v)	$x-7=1$	$x=8$	Yes

(vi)	$5x = 25$	$x = 0$	No
(vii)	$5x = 25$	$x = 5$	Yes
(viii)	$5x = 25$	$x = -5$	No
(viii)	$\frac{m}{3} = 2$	$m = -6$	No
(ix)	$\frac{m}{3} = 2$	$m = 0$	No
(x)	$\frac{m}{3} = 2$	$m = 6$	Yes

Question 2:

Check whether the value given in the brackets is a solution to the given equation or not:

(a) $n + 5 = 19$ ($n = 1$)

(b) $7n + 5 = 19$ ($n = -2$)

(c) $7n + 5 = 19$ ($n = 2$)

(d) $4p - 3 = 13$ ($p = 1$)

(e) $4p - 3 = 13$ ($p = -4$)

(f) $4p - 3 = 13$ ($p = 0$)

Answer 2:

(a) $n + 5 = 19$ ($n = 1$)

Putting $n = 1$ in L.H.S.,

$$1 + 5 = 6$$

$\therefore$ L.H.S. $\neq$ R.H.S.,

$\therefore$ $n = 1$ is not the solution of given equation.

(b) $7n + 5 = 19$ ($n = -2$)

Putting $n = -2$ in L.H.S.,

$$7(-2) + 5 = -14 + 5 = -9$$

$\therefore$ L.H.S. $\neq$ R.H.S.,

$\therefore$ $n = -2$ is not the solution of given equation.

(c) $7n + 5 = 19$ ($n = 2$)

Putting $n = 2$ in L.H.S.,

$$7(2) + 5 = 14 + 5 = 19$$

$\therefore$ L.H.S. = R.H.S.,

$\therefore n = 2$ is the solution of given equation.

(a) $4p - 3 = 13$ ($p = 1$)

Putting $p = 1$ in L.H.S.,

$$4(1) - 3 = 4 - 3 = 1$$

$\therefore$ L.H.S. $\neq$ R.H.S.,

$\therefore p = 1$ is not the solution of given equation.

(b) $4p - 3 = 13$ ($p = -4$)

Putting $p = -4$ in L.H.S.,

$$4(-4) - 3 = -16 - 3 = -19$$

$\therefore$ L.H.S. $\neq$ R.H.S.,

$\therefore p = -4$ is not the solution of given equation.

(c) $4p - 3 = 13$ ($p = 0$)

Putting $p = 0$ in L.H.S.,

$$4(0) - 3 = 0 - 3 = -3$$

$\therefore$ L.H.S. $\neq$ R.H.S.,

$\therefore p = 0$ is not the solution of given equation.

Question 3:

Solve the following equations by trial and error method:

(i) $5p + 2 = 17$

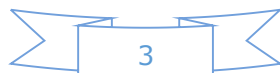
(ii) $3m - 14 = 4$

Answer 3:

(i) $5p + 2 = 17$

Putting $p = -3$ in L.H.S. $5(-3) + 2 = -15 + 2 = -13$

$\therefore -13 \neq 17$ Therefore, $p = -3$ is not the solution.



Putting $p = -2$ in L.H.S. $5(-2) + 2 = -10 + 2 = -8$

$\therefore -8 \neq 17$ Therefore, $p = -2$ is not the solution.

Putting $p = -1$ in L.H.S. $5(-1) + 2 = -5 + 2 = -3$

$\therefore -3 \neq 17$ Therefore, $p = -1$ is not the solution.

Putting $p = 0$ in L.H.S. $5(0) + 2 = 0 + 2 = 2$

$\therefore 2 \neq 17$ Therefore, $p = 0$ is not the solution.

Putting $p = 1$ in L.H.S. $5(1) + 2 = 5 + 2 = 7$

$\therefore 7 \neq 17$ Therefore, $p = 1$ is not the solution.

Putting $p = 2$ in L.H.S. $5(2) + 2 = 10 + 2 = 12$

$\therefore 12 \neq 17$ Therefore, $p = 2$ is not the solution.

Putting $p = 3$ in L.H.S. $5(3) + 2 = 15 + 2 = 17$

$\therefore 17 = 17$ Therefore, $p = 3$ is the solution.

(ii) $3m - 14 = 4$

Putting $m = -2$ in L.H.S. $3(-2) - 14 = -6 - 14 = -20$

$\therefore -20 \neq 4$ Therefore, $m = -2$ is not the solution.

Putting $m = -1$ in L.H.S. $3(-1) - 14 = -3 - 14 = -17$

$\therefore -17 \neq 4$ Therefore, $m = -1$ is not the solution.

Putting $m = 0$ in L.H.S. $3(0) - 14 = 0 - 14 = -14$

$\therefore -14 \neq 4$ Therefore, $m = 0$ is not the solution.

Putting $m = 1$ in L.H.S. $3(1) - 14 = 3 - 14 = -11$

$\therefore -11 \neq 4$ Therefore, $m = 1$ is not the solution.

Putting $m = 2$ in L.H.S. $3(2) - 14 = 6 - 14 = -8$

$\therefore -8 \neq 4$ Therefore, $m = 2$ is not the solution.

Putting $m = 3$ in L.H.S. $3(3) - 14 = 9 - 14 = -5$

$\therefore -5 \neq 4$ Therefore, $m = 3$ is not the solution.

Putting $m = 4$ in L.H.S. $3(4) - 14 = 12 - 14 = -2$

$\therefore -2 \neq 4$ Therefore, $m = 4$ is not the solution.

Putting $m = 5$ in L.H.S. $3(5) - 14 = 15 - 14 = 1$

$\therefore 1 \neq 4$ Therefore, $m = 5$ is not the solution.

Putting $m = 6$ in L.H.S. $3(6) - 14 = 18 - 14 = 4$

$\therefore 4 = 4$ Therefore, $m = 6$ is the solution.



Question 4:

Write equations for the following statements:

- (i) The sum of numbers x and 4 is 9.
- (ii) 2 subtracted from y is 8.
- (iii) Ten times a is 70.
- (iv) The number b divided by 5 gives 6.
- (v) Three-fourth of t is 15.
- (vi) Seven times m plus 7 gets you 77.
- (vii) One-fourth of a number x minus 4 gives 4.
- (viii) If you take away 6 from 6 times y , you get 60.
- (ix) If you add 3 to one-third of z , you get 30.

Answer 4:

- | | |
|-----------------------------|------------------------|
| (i) $x + 4 = 9$ | (ii) $y - 2 = 8$ |
| (iii) $10a = 70$ | (iv) $\frac{b}{5} = 6$ |
| (v) $\frac{3}{4}t = 15$ | (vi) $7m + 7 = 77$ |
| (vii) $\frac{x}{4} - 4 = 4$ | (viii) $6y - 6 = 60$ |
| (ix) $\frac{z}{3} + 3 = 30$ | |

Question 5:

Write the following equations in statement form:

- | | |
|------------------------|------------------------------|
| (i) $p + 4 = 15$ | (ii) $m - 7 = 3$ |
| (iii) $2m = 7$ | (iv) $\frac{m}{5} = 3$ |
| (v) $\frac{3m}{5} = 6$ | (vi) $3p + 4 = 25$ |
| (vii) $4p - 2 = 18$ | (viii) $\frac{p}{2} + 2 = 8$ |

Answer 5:

- (i) The sum of numbers p and 4 is 15.
- (ii) 7 subtracted from m is 3.
- (iii) Two times m is 7.
- (iv) The number m is divided by 5 gives 3.
- (v) Three-fifth of the number m is 6.
- (vi) Three times p plus 4 gets 25.
- (vii) If you take away 2 from 4 times p , you get 18.
- (viii) If you added 2 to half is p , you get 8.

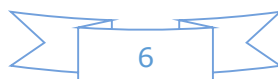
Question 6:

Set up an equation in the following cases:

- (i) Irfan says that he has 7 marbles more than five times the marbles Parmit has. Irfan has 37 marbles. (Take m to be the number of Parmit's marbles.)
- (ii) Laxmi's father is 49 years old. He is 4 years older than three times Laxmi's age. (Take Laxmi's age to be y years.)
- (iii) The teacher tells the class that the highest marks obtained by a student in her class are twice the lowest marks plus 7. The highest score is 87. (Take the lowest score to be l .)
- (iv) In an isosceles triangle, the vertex angle is twice either base angle. (Let the base angle be b in degrees. Remember that the sum of angles of a triangle is 180° .)

Answer 6:

- (i) Let m be the number of Parmit's marbles.
 $\therefore 5m + 7 = 37$
- (ii) Let the age of Laxmi be y years.
 $\therefore 3y + 4 = 49$
- (iii) Let the lowest score be l .
 $\therefore 2l + 7 = 87$
- (iv) Let the base angle of the isosceles triangle be b , so vertex angle = $2b$.
 $\therefore 2b + b + b = 180^\circ$
 $\Rightarrow 4b = 180^\circ$ [Angle sum property of a Δ]



Exercise 4.2

Question 1:

Give first the step you will use to separate the variable and then solve the equations:

(a) $x - 1 = 0$

(b) $x + 1 = 0$

(c) $x - 1 = 5$

(d) $x + 6 = 2$

(e) $y - 4 = -7$

(f) $y - 4 = 4$

(g) $y + 4 = 4$

(h) $y + 4 = -4$

Answer 1:

(a) $x - 1 = 0$

$$\Rightarrow x - 1 + 1 = 0 + 1$$

[Adding 1 both sides]

$$\Rightarrow x = 1$$

(b) $x + 1 = 0$

$$\Rightarrow x + 1 - 1 = 0 - 1$$

[Subtracting 1 both sides]

$$\Rightarrow x = -1$$

(c) $x - 1 = 5$

$$\Rightarrow x - 1 + 1 = 5 + 1$$

[Adding 1 both sides]

$$\Rightarrow x = 6$$

(d) $x + 6 = 2$

$$\Rightarrow x + 6 - 6 = 2 - 6$$

[Subtracting 6 both sides]

$$\Rightarrow x = -4$$

(e) $y - 4 = -7$

$$\Rightarrow y - 4 + 4 = -7 + 4$$

[Adding 4 both sides]

$$\Rightarrow y = -3$$

(f) $y - 4 = 4$

$$\Rightarrow y - 4 + 4 = 4 + 4$$

[Adding 4 both sides]

$$\Rightarrow y = 8$$

(g) $y + 4 = 4$

$$\Rightarrow y + 4 - 4 = 4 - 4$$

[Subtracting 4 both sides]

$$\Rightarrow y = 0$$

(h) $y + 4 = -4$

$$\Rightarrow y + 4 - 4 = -4 - 4$$

[Subtracting 4 both sides]

$$\Rightarrow y = -8$$

Question 2:

Give first the step you will use to separate the variable and then solve the equations

(a) $3l = 42$

(b) $\frac{b}{2} = 6$

(c) $\frac{p}{7} = 4$

(d) $4x = 25$

(e) $8y = 36$

(f) $\frac{z}{3} = \frac{5}{4}$

(g) $\frac{a}{5} = \frac{7}{15}$

(h) $20t = -10$

Answer 2:

(a) $3l = 42$

$$\Rightarrow \frac{3l}{3} = \frac{42}{3}$$

[Dividing both sides by 3]

$$\Rightarrow l = 14$$

(b) $\frac{b}{2} = 6$

$$\Rightarrow \frac{b}{2} \times 2 = 6 \times 2$$

[Multiplying both sides by 2]

$$\Rightarrow b = 12$$

(c) $\frac{p}{7} = 4$

$$\Rightarrow \frac{p}{7} \times 7 = 4 \times 7$$

[Multiplying both sides by 7]

$$\Rightarrow p = 28$$

(d) $4x = 25$

$$\Rightarrow \frac{4x}{4} = \frac{25}{4}$$

[Dividing both sides by 4]

$$\Rightarrow x = \frac{25}{4}$$

(e) $8y = 36$

$$\Rightarrow \frac{8y}{8} = \frac{36}{8}$$

[Dividing both sides by 8]

$$\Rightarrow y = \frac{9}{2}$$

$$(f) \frac{z}{3} = \frac{5}{4}$$

$$\Rightarrow \frac{z}{3} \times 3 = \frac{5}{4} \times 3$$

[Multiplying both sides by 3]

$$\Rightarrow z = \frac{15}{4}$$

$$(g) \frac{a}{5} = \frac{7}{15}$$

$$\Rightarrow \frac{a}{5} \times 5 = \frac{7}{15} \times 5$$

[Multiplying both sides by 5]

$$\Rightarrow a = \frac{7}{3}$$

$$(h) 20t = -10$$

$$\Rightarrow \frac{20t}{20} = \frac{-10}{20}$$

[Dividing both sides by 20]

$$\Rightarrow t = \frac{-1}{2}$$

Question 3:

Give first the step you will use to separate the variable and then solve the equations

$$(a) 3n - 2 = 46$$

$$(b) 5m + 7 = 17$$

$$(c) \frac{20p}{3} = 40$$

$$(d) \frac{3p}{10} = 6$$

Answer 3:

$$(a) 3n - 2 = 46$$

$$\text{Step I: } 3n - 2 + 2 = 46 + 2$$

$$\Rightarrow 3n = 48$$

[Adding 2 both sides]

$$\text{Step II: } \frac{3n}{3} = \frac{48}{3}$$

$$\Rightarrow n = 16$$

[Dividing both sides by 3]

$$(b) 5m + 7 = 17$$

$$\text{Step I: } 5m + 7 - 7 = 17 - 7$$

$$\Rightarrow 5m = 10$$

[Subtracting 7 both sides]

$$\text{Step II: } \frac{5m}{5} = \frac{10}{5}$$

$$\Rightarrow m = 2$$

[Dividing both sides by 5]



$$(c) \frac{20p}{3} = 40$$

$$\text{Step I: } \frac{20p}{3} \times 3 = 40 \times 3$$

$$\Rightarrow 20p = 120 \quad [\text{Multiplying both sides by 3}]$$

$$\text{Step II: } \frac{20p}{20} = \frac{120}{20}$$

$$\Rightarrow p = 6 \quad [\text{Dividing both sides by 20}]$$

$$(d) \frac{3p}{10} = 6$$

$$\text{Step I: } \frac{3p}{10} \times 10 = 6 \times 10$$

$$\Rightarrow 3p = 60 \quad [\text{Multiplying both sides by 10}]$$

$$\text{Step II: } \frac{3p}{3} = \frac{60}{3}$$

$$\Rightarrow p = 20 \quad [\text{Dividing both sides by 3}]$$

Question 4:

Solve the following equation:

$$(a) 10p = 100$$

$$(b) 10p + 10 = 100$$

$$(c) \frac{p}{4} = 5$$

$$(d) \frac{-p}{3} = 5$$

$$(e) \frac{3p}{4} = 6$$

$$(f) 3s = -9$$

$$(g) 3s + 12 = 0$$

$$(h) 3s = 0$$

$$(i) 2q = 6$$

$$(j) 2q - 6 = 0$$

$$(k) 2q + 6 = 0$$

$$(l) 2q + 6 = 12$$

Answer 4:

$$(a) 10p = 100$$

$$\Rightarrow \frac{10p}{10} = \frac{100}{10} \quad [\text{Dividing both sides by 10}]$$

$$\Rightarrow p = 10$$

$$(b) 10p + 10 = 100$$

$$\Rightarrow 10p + 10 - 10 = 100 - 10 \quad [\text{Subtracting both sides 10}]$$

$$\Rightarrow 10p = 90$$

$$\Rightarrow \frac{10p}{10} = \frac{90}{10}$$

[Dividing both sides by 10]

$$\Rightarrow p = 9$$

(c) $\frac{p}{4} = 5$

$$\Rightarrow \frac{p}{4} \times 4 = 5 \times 4$$

[Multiplying both sides by 4]

$$\Rightarrow p = 20$$

(d) $\frac{-p}{3} = 5$

$$\Rightarrow \frac{-p}{3} \times (-3) = 5 \times (-3)$$

[Multiplying both sides by - 3]

$$\Rightarrow p = -15$$

(e) $\frac{3p}{4} = 6$

$$\Rightarrow \frac{3p}{4} \times 4 = 6 \times 4$$

[Multiplying both sides by 4]

$$\Rightarrow 3p = 24$$

$$\Rightarrow \frac{3p}{3} = \frac{24}{3}$$

[Dividing both sides by 3]

$$\Rightarrow p = 8$$

(f) $3s = -9$

$$\Rightarrow \frac{3s}{3} = \frac{-9}{3}$$

[Dividing both sides by 3]

$$\Rightarrow s = -3$$

(g) $3s + 12 = 0$

$$\Rightarrow 3s + 12 - 12 = 0 - 12$$

[Subtracting both sides 10]

$$\Rightarrow 3s = -12$$

$$\Rightarrow \frac{3s}{3} = \frac{-12}{3}$$

[Dividing both sides by 3]

$$\Rightarrow s = -4$$

(h) $3s = 0$

$$\Rightarrow \frac{3s}{3} = \frac{0}{3}$$

[Dividing both sides by 3]

$$\Rightarrow s = 0$$

(i) $2q = 6$

$$\Rightarrow \frac{2q}{2} = \frac{6}{2}$$

[Dividing both sides by 2]

$$\Rightarrow q = 3$$

(j) $2q - 6 = 0$

$$\Rightarrow 2q - 6 + 6 = 0 + 6$$

[Adding both sides 6]

$$\Rightarrow 2q = 6$$

$$\Rightarrow \frac{2q}{2} = \frac{6}{2}$$

[Dividing both sides by 2]

$$\Rightarrow q = 3$$

(k) $2q + 6 = 0$

$$\Rightarrow 2q + 6 - 6 = 0 - 6$$

[Subtracting both sides 6]

$$\Rightarrow 2q = -6$$

$$\Rightarrow \frac{2q}{2} = \frac{-6}{2}$$

[Dividing both sides by 2]

$$\Rightarrow q = -3$$

(l) $2q + 6 = 12$

$$\Rightarrow 2q + 6 - 6 = 12 - 6$$

[Subtracting both sides 6]

$$\Rightarrow 2q = 6$$

$$\Rightarrow \frac{2q}{2} = \frac{6}{2}$$

[Dividing both sides by 2]

$$\Rightarrow q = 3$$

Exercise 4.3

Question 1:

Solve the following equations:

$$(a) \ 2y + \frac{5}{2} = \frac{37}{2}$$

$$(b) \ 5t + 28 = 10$$

$$(c) \ \frac{a}{5} + 3 = 2$$

$$(d) \ \frac{q}{4} + 7 = 5$$

$$(e) \ \frac{5}{2}x = 10$$

$$(f) \ \frac{5}{2}x = \frac{25}{4}$$

$$(g) \ 7m + \frac{19}{2} = 13$$

$$(h) \ 6z + 10 = -2$$

$$(i) \ \frac{3l}{2} = \frac{2}{3}$$

$$(j) \ \frac{2b}{3} - 5 = 3$$

Answer 1:

$$(a) \ 2y + \frac{5}{2} = \frac{37}{2}$$

$$\Rightarrow \ 2y = \frac{37}{2} - \frac{5}{2}$$

$$\Rightarrow \ 2y = \frac{37-5}{2}$$

$$\Rightarrow \ 2y = \frac{32}{2}$$

$$\Rightarrow \ 2y = 16$$

$$\Rightarrow \ y = \frac{16}{2}$$

$$\Rightarrow \ y = 8$$

$$(b) \ 5t + 28 = 10$$

$$\Rightarrow \ 5t = 10 - 28$$

$$\Rightarrow \ 5t = -18$$

$$\Rightarrow \ t = \frac{-18}{5}$$

$$(c) \ \frac{a}{5} + 3 = 2$$

$$\Rightarrow \ \frac{a}{5} = 2 - 3$$

$$\Rightarrow \frac{a}{5} = -1$$

$$\Rightarrow a = -1 \times 5$$

$$\Rightarrow a = -5$$

$$(d) \frac{q}{4} + 7 = 5$$

$$\Rightarrow \frac{q}{4} = 5 - 7$$

$$\Rightarrow \frac{q}{4} = -2$$

$$\Rightarrow q = -2 \times 4$$

$$\Rightarrow q = -8$$

$$(e) \frac{5}{2}x = 10$$

$$\Rightarrow 5x = 10 \times 2$$

$$\Rightarrow 5x = 20$$

$$\Rightarrow x = \frac{20}{5}$$

$$\Rightarrow x = 4$$

$$(f) \frac{5}{2}x = \frac{25}{4}$$

$$\Rightarrow 5x = \frac{25}{4} \times 2$$

$$\Rightarrow 5x = \frac{25}{2}$$

$$\Rightarrow x = \frac{25}{2 \times 5}$$

$$\Rightarrow x = \frac{5}{2}$$

$$(g) 7m + \frac{19}{2} = 13$$

$$\Rightarrow 7m = 13 - \frac{19}{2}$$

$$\Rightarrow 7m = \frac{26-19}{2}$$

$$\Rightarrow 7m = \frac{7}{2}$$

$$\Rightarrow m = \frac{7}{2 \times 7}$$

$$\Rightarrow m = \frac{1}{2}$$

$$(h) 6z + 10 = -2$$

$$\Rightarrow 6z = -2 - 10$$

$$\Rightarrow 6z = -12$$

$$\Rightarrow z = \frac{-12}{6}$$

$$\Rightarrow z = -2$$

$$(i) \frac{3l}{2} = \frac{2}{3}$$

$$\Rightarrow 3l = \frac{2}{3} \times 2$$

$$\Rightarrow 3l = \frac{4}{3}$$

$$\Rightarrow l = \frac{4}{3 \times 3}$$

$$\Rightarrow l = \frac{4}{9}$$

$$(j) \frac{2b}{3} - 5 = 3$$

$$\Rightarrow \frac{2b}{3} = 3 + 5$$

$$\Rightarrow \frac{2b}{3} = 8$$

$$\Rightarrow 2b = 8 \times 3$$

$$\Rightarrow 2b = 24$$

$$\Rightarrow b = \frac{24}{2}$$

$$\Rightarrow b = 12$$

Question 2:

Solve the following equations:

(a) $2(x+4)=12$

(c) $3(n-5)=-21$

(e) $-4(2-x)=9$

(g) $4+5(p-1)=34$

(b) $3(n-5)=21$

(d) $3-2(2-y)=7$

(f) $4(2-x)=9$

(h) $34-5(p-1)=4$

Answer 2:

(a) $2(x+4)=12$

$$\Rightarrow x+4=\frac{12}{2}$$

$$\Rightarrow x+4=6$$

$$\Rightarrow x=6-4$$

$$\Rightarrow x=2$$

(b) $3(n-5)=21$

$$\Rightarrow n-5=\frac{21}{3}$$

$$\Rightarrow n-5=7$$

$$\Rightarrow n=7+5$$

$$\Rightarrow n=12$$

(c) $3(n-5)=-21$

$$\Rightarrow n-5=\frac{-21}{3}$$

$$\Rightarrow n-5=-7$$

$$\Rightarrow n=-7+5$$

$$\Rightarrow n=-2$$

(d) $3-2(2-y)=7$

$$\Rightarrow -2(2-y)=7-3$$

$$\Rightarrow -2(2-y)=4$$

$$\Rightarrow 2-y=\frac{4}{-2}$$

$$\begin{aligned}\Rightarrow 2 - y &= -2 \\ \Rightarrow -y &= -2 - 2 \\ \Rightarrow -y &= -4 \\ \Rightarrow y &= 4\end{aligned}$$

$$(e) -4(2 - x) = 9$$

$$\begin{aligned}\Rightarrow -4 \times 2 - x \times (-4) &= 9 \\ \Rightarrow -8 + 4x &= 9 \\ \Rightarrow 4x &= 9 + 8 \\ \Rightarrow 4x &= 17 \\ \Rightarrow x &= \frac{17}{4}\end{aligned}$$

$$(f) 4(2 - x) = 9$$

$$\begin{aligned}\Rightarrow 4 \times 2 - x \times (4) &= 9 \\ \Rightarrow 8 - 4x &= 9 \\ \Rightarrow -4x &= 9 - 8 \\ \Rightarrow -4x &= 1 \\ \Rightarrow x &= \frac{-1}{4}\end{aligned}$$

$$(g) 4 + 5(p - 1) = 34$$

$$\begin{aligned}\Rightarrow 5(p - 1) &= 34 - 4 \\ \Rightarrow 5(p - 1) &= 30 \\ \Rightarrow p - 1 &= \frac{30}{5} \\ \Rightarrow p - 1 &= 6 \\ \Rightarrow p &= 6 + 1 \\ \Rightarrow p &= 7\end{aligned}$$

$$(h) 34 - 5(p - 1) = 4$$

$$\begin{aligned}\Rightarrow -5(p - 1) &= 4 - 34 \\ \Rightarrow -5(p - 1) &= -30\end{aligned}$$

$$\begin{aligned}\Rightarrow p-1 &= \frac{-30}{-5} \\ \Rightarrow p-1 &= 6 \\ \Rightarrow p &= 6+1 \\ \Rightarrow p &= 7\end{aligned}$$

Question 3:

Solve the following equations:

(a) $4 = 5(p-2)$

(b) $-4 = 5(p-2)$

(c) $-16 = -5(2-p)$

(d) $10 = 4+3(t+2)$

(e) $28 = 4+3(t+5)$

(f) $0 = 16+4(m-6)$

Answer 3:

(a) $4 = 5(p-2)$

$$\begin{aligned}\Rightarrow 4 &= 5 \times p - 5 \times 2 \\ \Rightarrow 4 &= 5p - 10 \\ \Rightarrow 5p - 10 &= 4 \\ \Rightarrow 5p &= 4 + 10 \\ \Rightarrow 5p &= 14 \\ \Rightarrow p &= \frac{14}{5}\end{aligned}$$

(b) $-4 = 5(p-2)$

$$\begin{aligned}\Rightarrow -4 &= 5 \times p - 5 \times 2 \\ \Rightarrow -4 &= 5p - 10 \\ \Rightarrow 5p - 10 &= -4 \\ \Rightarrow 5p &= -4 + 10 \\ \Rightarrow 5p &= 6 \\ \Rightarrow p &= \frac{6}{5}\end{aligned}$$

$$(c) -16 = -5(2 - p)$$

$$\Rightarrow -16 = -5 \times 2 - (-5) \times p$$

$$\Rightarrow -16 = -10 + 5p$$

$$\Rightarrow -10 + 5p = -16$$

$$\Rightarrow 5p = -16 + 10$$

$$\Rightarrow 5p = -6$$

$$\Rightarrow p = \frac{-6}{5}$$

$$(d) 10 = 4 + 3(t + 2)$$

$$\Rightarrow 10 - 4 = 3(t + 2)$$

$$\Rightarrow 6 = 3(t + 2)$$

$$\Rightarrow \frac{6}{3} = t + 2$$

$$\Rightarrow 2 = t + 2$$

$$\Rightarrow 2 - 2 = t$$

$$\Rightarrow 0 = t$$

$$\Rightarrow t = 0$$

$$(e) 28 = 4 + 3(t + 5)$$

$$\Rightarrow 28 - 4 = 3(t + 5)$$

$$\Rightarrow 24 = 3(t + 5)$$

$$\Rightarrow \frac{24}{3} = t + 5$$

$$\Rightarrow 8 = t + 5$$

$$\Rightarrow 8 - 5 = t$$

$$\Rightarrow 3 = t$$

$$\Rightarrow t = 3$$

$$(f) 0 = 16 + 4(m - 6)$$

$$\Rightarrow 0 - 16 = 4(m - 6)$$

$$\Rightarrow -16 = 4(m - 6)$$

$$\Rightarrow \frac{-16}{4} = m - 6$$

$$\Rightarrow -4 = m - 6$$

$$\Rightarrow -4 + 6 = m$$

$$\Rightarrow 2 = m$$

$$\Rightarrow m = 2$$

Question 4:

(a) Construct 3 equations starting with $x = 2$.

(b) Construct 3 equations starting with $x = -2$.

Answer 4:

(a) 3 equations starting with $x = 2$.

(i) $x = 2$

Multiplying both sides by 10,

$$10x = 20$$

Adding 2 both sides

$$10x + 2 = 20 + 2 = 10x + 2 = 22$$

(ii) $x = 2$

Multiplying both sides by 5

$$5x = 10$$

Subtracting 3 from both sides

$$5x - 3 = 10 - 3 = 5x - 3 = 7$$

(iii) $x = 2$

Dividing both sides by 5

$$\frac{x}{5} = \frac{2}{5}$$

(b) 3 equations starting with $x = -2$.

(i) $x = -2$

Multiplying both sides by 3

$$3x = -6$$

(ii) $x = -2$

Multiplying both sides by 3

$$3x = -6$$

Adding 7 to both sides

$$3x + 7 = -6 + 7 = 3x + 7 = 1$$

(iii) $x = -2$

Multiplying both sides by 3

$$3x = -6$$

Adding 10 to both sides

$$3x + 10 = -6 + 10 = 3x + 10 = 4$$

Exercise 4.4

Question 1:

Set up equations and solve them to find the unknown numbers in the following cases:

- (a) Add 4 to eight times a number; you get 60.
- (b) One-fifth of a number minus 4 gives 3.
- (c) If I take three-fourth of a number and add 3 to it, I get 21.
- (d) When I subtracted 11 from twice a number, the result was 15.
- (e) Munna subtracts thrice the number of notebooks he has from 50, he finds the result to be 8.
- (f) Ibenhal thinks of a number. If she adds 19 to it divides the sum by 5, she will get 8.
- (g) Answer thinks of a number. If he takes away 7 from $\frac{5}{2}$ of the number, the result is $\frac{11}{2}$.

Answer 1:

- (a) Let the number be x .

According to the question, $8x + 4 = 60$

$$\Rightarrow 8x = 60 - 4$$

$$\Rightarrow 8x = 56$$

$$\Rightarrow x = \frac{56}{8}$$

$$\Rightarrow x = 7$$

- (b) Let the number be y .

According to the question, $\frac{y}{5} - 4 = 3$

$$\Rightarrow \frac{y}{5} = 3 + 4$$

$$\Rightarrow \frac{y}{5} = 7$$

$$\Rightarrow y = 7 \times 5$$

$$\Rightarrow y = 35$$

(c) Let the number be z .

According to the question, $\frac{3}{4}z + 3 = 21$

$$\Rightarrow \frac{3}{4}z = 21 - 3$$

$$\Rightarrow \frac{3}{4}z = 18$$

$$\Rightarrow 3z = 18 \times 4$$

$$\Rightarrow 3z = 72$$

$$\Rightarrow z = \frac{72}{3}$$

$$\Rightarrow z = 24$$

(d) Let the number be x .

According to the question, $2x - 11 = 15$

$$\Rightarrow 2x = 15 + 11$$

$$\Rightarrow 2x = 26$$

$$\Rightarrow x = \frac{26}{2}$$

$$\Rightarrow x = 13$$

(e) Let the number be m .

According to the question, $50 - 3m = 8$

$$\Rightarrow -3m = 8 - 50$$

$$\Rightarrow -3m = -42$$

$$\Rightarrow m = \frac{-42}{-3}$$

$$\Rightarrow m = 14$$

(f) Let the number be n .

According to the question, $\frac{n+19}{5} = 8$

$$\Rightarrow n + 19 = 8 \times 5$$

$$\Rightarrow n + 19 = 40$$

$$\Rightarrow n = 40 - 19$$

$$\Rightarrow n = 21$$

(g) Let the number be x .

According to the question, $\frac{5}{2}x - 7 = \frac{11}{2}$

$$\Rightarrow \frac{5}{2}x = \frac{11}{2} + 7$$

$$\Rightarrow \frac{5}{2}x = \frac{11+14}{2}$$

$$\Rightarrow \frac{5}{2}x = \frac{25}{2}$$

$$\Rightarrow 5x = \frac{25 \times 2}{2}$$

$$\Rightarrow 5x = 25$$

$$\Rightarrow x = \frac{25}{5}$$

$$\Rightarrow x = 5$$

Question 2:

Solve the following:

- (a) The teacher tells the class that the highest marks obtained by a student in her class are twice the lowest marks plus 7. The highest score is 87. What is the lowest score?
- (b) In an isosceles triangle, the base angles are equal. The vertex angle is 40° . What are the base angles of the triangle? (Remember, the sum of three angles of a triangle is 180° .)
- (c) Sachin scored twice as many runs as Rahul. Together, their runs fell two short of a double century. How many runs did each one score?

Answer 2:

(a) Let the lowest marks be y .

According to the question, $2y + 7 = 87$

$$\Rightarrow 2y = 87 - 7$$

$$\Rightarrow 2y = 80$$

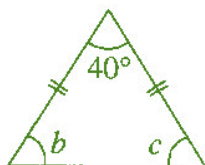
$$\Rightarrow y = \frac{80}{2}$$

$$\Rightarrow y = 40$$

Thus, the lowest score is 40.

(b) Let the base angle of the triangle be b .

Given, $a = 40^\circ, b = c$



Since, $a + b + c = 180^\circ$ [Angle sum property of a triangle]

$$\Rightarrow 40^\circ + b + b = 180^\circ$$

$$\Rightarrow 40^\circ + 2b = 180^\circ$$

$$\Rightarrow 2b = 180^\circ - 40^\circ$$

$$\Rightarrow 2b = 140^\circ$$

$$\Rightarrow b = \frac{140^\circ}{2}$$

$$\Rightarrow b = 70^\circ$$

Thus, the base angles of the isosceles triangle are 70° each.

(c) Let the score of Rahul be x runs and Sachin's score is $2x$.

According to the question, $x + 2x = 198$

$$\Rightarrow 3x = 198$$

$$\Rightarrow x = \frac{198}{3}$$

$$\Rightarrow x = 66$$

Thus, Rahul's score = 66 runs

And Sachin's score = $2 \times 66 = 132$ runs.

Question 3:

Solve the following:

- (i) Irfan says that he has 7 marbles more than five times the marbles Parmit has. Irfan has 37 marbles. How many marbles does Parmit have?
- (ii) Laxmi's father is 49 years old. He is 4 years older than three times Laxmi's age. What is Laxmi's age?
- (iii) People of Sundergram planted a total of 102 trees in the village garden. Some of the trees were fruit trees. The number of non-fruit trees were two more than three times the number of fruit trees. What was the number of fruit trees planted?

Answer 3:

- (i) Let the number of marbles Parmit has be m .

According to the question, $5m + 7 = 37$

$$\Rightarrow 5m = 37 - 7$$

$$\Rightarrow 5m = 30$$

$$\Rightarrow m = \frac{30}{5}$$

$$\Rightarrow m = 6$$

Thus, Parmit has 6 marbles.

- (ii) Let the age of Laxmi be y years.

Then her father's age = $(3y + 4)$ years

According to question, $3y + 4 = 49$

$$\Rightarrow 3y = 49 - 4$$

$$\Rightarrow 3y = 45$$

$$\Rightarrow y = \frac{45}{3}$$

$$\Rightarrow y = 15$$

Thus, the age of Laxmi is 15 years.

- (iii) Let the number of fruit trees be t .

Then the number of non-fruits tree = $3t + 2$

According to the question, $t + 3t + 2 = 102$

$$\Rightarrow 4t + 2 = 102$$

$$\Rightarrow 4t = 102 - 2$$

$$\Rightarrow 4t = 100$$

$$\Rightarrow t = \frac{100}{4}$$

$$\Rightarrow t = 25$$

Thus, the number of fruit trees are 25.



Question 4:

Solve the following riddle:

I am a number,
Tell my identity!
Take me seven times over,
And add a fifty!
To reach a triple century,
You still need forty!

Answer 4:

Let the number be n .

According to the question, $7n + 50 + 40 = 300$

$$\Rightarrow 7n + 90 = 300$$

$$\Rightarrow 7n = 300 - 90$$

$$\Rightarrow 7n = 210$$

$$\Rightarrow n = \frac{210}{7}$$

$$\Rightarrow n = 30$$

Thus, the required number is 30.