

1. Complete the last column of the table:

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

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

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

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

3. Solve the following equations by trial and error method:

(ii) $3m - 14 = 4$

4. Write equations for the following statements:

(ix) If you add 3 to one-third of z , you get 30.

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) $\frac{p}{2} + 2 = 8$

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° .)

Class -VII Mathematics (Ex. 4.1)

Answers

1. Sol.

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

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.

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

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.

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

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.

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

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.

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.

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) $\frac{z}{3} + 3 = 30$

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.

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]

Class -VII Mathematics (Ex. 4.2)

Questions

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) $y + 4 = -4$

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) $20t = -10$

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

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) $2q + 6 = 12$

Class -VII Mathematics (Ex. 4.2)**Answers**

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]
 $\Rightarrow y=-8$
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]
 $\Rightarrow y=\frac{9}{2}$

$$(f) \frac{z}{3} = \frac{5}{4} \quad \Rightarrow \quad \frac{z}{3} \times 3 = \frac{5}{4} \times 3 \quad [\text{Multiplying both sides by 3}]$$

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

$$(g) \frac{a}{5} = \frac{7}{15} \quad \Rightarrow \quad \frac{a}{5} \times 5 = \frac{7}{15} \times 5 \quad [\text{Multiplying both sides by 5}]$$

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

$$(h) 20t = -10 \quad \Rightarrow \quad \frac{20t}{20} = \frac{-10}{20} \quad [\text{Dividing both sides by 20}]$$

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

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

$$\text{Step I: } 3n - 2 + 2 = 46 + 2 \quad \Rightarrow \quad 3n = 48 \quad [\text{Adding 2 both sides}]$$

$$\text{Step II: } \frac{3n}{3} = \frac{48}{3} \quad \Rightarrow \quad n = 16 \quad [\text{Dividing both sides by 3}]$$

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

$$\text{Step I: } 5m + 7 - 7 = 17 - 7 \quad \Rightarrow \quad 5m = 10 \quad [\text{Subtracting 7 both sides}]$$

$$\text{Step II: } \frac{5m}{5} = \frac{10}{5} \quad \Rightarrow \quad m = 2 \quad [\text{Dividing both sides by 5}]$$

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

$$\text{Step I: } \frac{20p}{3} \times 3 = 40 \times 3 \quad \Rightarrow \quad 20p = 120 \quad [\text{Multiplying both sides by 3}]$$

$$\text{Step II: } \frac{20p}{20} = \frac{120}{20} \quad \Rightarrow \quad p = 6 \quad [\text{Dividing both sides by 20}]$$

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

$$\text{Step I: } \frac{3p}{10} \times 10 = 6 \times 10 \quad \Rightarrow \quad 3p = 60 \quad [\text{Multiplying both sides by 10}]$$

$$\text{Step II: } \frac{3p}{3} = \frac{60}{3} \quad \Rightarrow \quad p = 20 \quad [\text{Dividing both sides by 3}]$$

$$4. (a) 10p = 100 \quad \Rightarrow \quad \frac{10p}{10} = \frac{100}{10} \quad [\text{Dividing both sides by 10}]$$

$$\Rightarrow p = 10$$

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

$$\Rightarrow 10p = 90 \quad \Rightarrow \quad \frac{10p}{10} = \frac{90}{10} \quad [\text{Dividing both sides by 10}]$$

$$\Rightarrow p = 9$$

(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]
$\Rightarrow q = 3$			

Class -VII Mathematics (Ex. 4.3)
Questions

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

2. Solve the following equations:

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

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

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

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

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

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

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

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

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

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

Class -VII Mathematics (Ex. 4.3)

Answers

$$\begin{array}{llll}
 1. \quad (a) \quad 2y + \frac{5}{2} = \frac{37}{2} & \Rightarrow & 2y = \frac{37}{2} - \frac{5}{2} & \Rightarrow & 2y = \frac{37-5}{2} \\
 & \Rightarrow & 2y = \frac{32}{2} & \Rightarrow & 2y = 16 \\
 & \Rightarrow & y = 8 & \Rightarrow & y = \frac{16}{2} \\
 (b) \quad 5t + 28 = 10 & \Rightarrow & 5t = 10 - 28 & \Rightarrow & 5t = -18 \\
 & \Rightarrow & t = \frac{-18}{5} & & \\
 (c) \quad \frac{a}{5} + 3 = 2 & \Rightarrow & \frac{a}{5} = 2 - 3 & \Rightarrow & \frac{a}{5} = -1 \\
 & \Rightarrow & a = -1 \times 5 & \Rightarrow & a = -5 \\
 (d) \quad \frac{q}{4} + 7 = 5 & \Rightarrow & \frac{q}{4} = 5 - 7 & \Rightarrow & \frac{q}{4} = -2 \\
 & \Rightarrow & q = -2 \times 4 & \Rightarrow & q = -8 \\
 (e) \quad \frac{5}{2}x = 10 & \Rightarrow & 5x = 10 \times 2 & \Rightarrow & 5x = 20 \\
 & \Rightarrow & x = \frac{20}{5} & \Rightarrow & x = 4 \\
 (f) \quad \frac{5}{2}x = \frac{25}{4} & \Rightarrow & 5x = \frac{25}{4} \times 2 & \Rightarrow & 5x = \frac{25}{2} \\
 & \Rightarrow & x = \frac{25}{2 \times 5} & \Rightarrow & x = \frac{5}{2} \\
 (g) \quad 7m + \frac{19}{2} = 13 & \Rightarrow & 7m = 13 - \frac{19}{2} & \Rightarrow & 7m = \frac{26-19}{2} \\
 & \Rightarrow & 7m = \frac{7}{2} & \Rightarrow & m = \frac{7}{2 \times 7} \\
 & & & \Rightarrow & m = \frac{1}{2} \\
 (h) \quad 6z + 10 = -2 & \Rightarrow & 6z = -2 - 10 & \Rightarrow & 6z = -12 \\
 & \Rightarrow & z = \frac{-12}{6} & \Rightarrow & z = -2 \\
 (i) \quad \frac{3l}{2} = \frac{2}{3} & \Rightarrow & 3l = \frac{2}{3} \times 2 & \Rightarrow & 3l = \frac{4}{3} \\
 & \Rightarrow & l = \frac{4}{3 \times 3} & \Rightarrow & l = \frac{4}{9} \\
 (j) \quad \frac{2b}{3} - 5 = 3 & \Rightarrow & \frac{2b}{3} = 3 + 5 & \Rightarrow & \frac{2b}{3} = 8
 \end{array}$$

$$\Rightarrow 2b = 8 \times 3 \quad \Rightarrow \quad 2b = 24 \quad \Rightarrow \quad b = \frac{24}{2}$$

$$\Rightarrow b = 12$$

$$2. \quad (a) \quad 2(x+4) = 12 \quad \Rightarrow \quad x+4 = \frac{12}{2} \quad \Rightarrow \quad x+4 = 6$$

$$\Rightarrow x = 6 - 4 \quad \Rightarrow \quad x = 2$$

$$(b) \quad 3(n-5) = 21 \quad \Rightarrow \quad n-5 = \frac{21}{3} \quad \Rightarrow \quad n-5 = 7$$

$$\Rightarrow n = 7 + 5 \quad \Rightarrow \quad n = 12$$

$$(c) \quad 3(n-5) = -21 \quad \Rightarrow \quad n-5 = \frac{-21}{3} \quad \Rightarrow \quad n-5 = -7$$

$$\Rightarrow n = -7 + 5 \quad \Rightarrow \quad n = -2$$

$$(d) \quad 3 - 2(2-y) = 7 \quad \Rightarrow \quad -2(2-y) = 7 - 3 \quad \Rightarrow \quad -2(2-y) = 4$$

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

$$\Rightarrow -y = -4 \quad \Rightarrow \quad y = 4$$

$$(e) \quad -4(2-x) = 9 \quad \Rightarrow \quad -4 \times 2 - x \times (-4) = 9 \quad \Rightarrow \quad -8 + 4x = 9$$

$$\Rightarrow 4x = 9 + 8 \quad \Rightarrow \quad 4x = 17 \quad \Rightarrow \quad x = \frac{17}{4}$$

$$(f) \quad 4(2-x) = 9 \quad \Rightarrow \quad 4 \times 2 - x \times (4) = 9 \quad \Rightarrow \quad 8 - 4x = 9$$

$$\Rightarrow -4x = 9 - 8 \quad \Rightarrow \quad -4x = 1 \quad \Rightarrow \quad x = \frac{-1}{4}$$

$$(g) \quad 4 + 5(p-1) = 34 \quad \Rightarrow \quad 5(p-1) = 34 - 4 \quad \Rightarrow \quad 5(p-1) = 30$$

$$\Rightarrow p-1 = \frac{30}{5} \quad \Rightarrow \quad p-1 = 6 \quad \Rightarrow \quad p = 6 + 1$$

$$\Rightarrow p = 7$$

$$(h) \quad 34 - 5(p-1) = 4 \quad \Rightarrow \quad -5(p-1) = 4 - 34 \quad \Rightarrow \quad -5(p-1) = -30$$

$$\Rightarrow p-1 = \frac{-30}{-5} \quad \Rightarrow \quad p-1 = 6 \quad \Rightarrow \quad p = 6 + 1$$

$$\Rightarrow p = 7$$

$$3. \quad (a) \quad 4 = 5(p-2) \quad \Rightarrow \quad 4 = 5 \times p - 5 \times 2 \quad \Rightarrow \quad 4 = 5p - 10$$

$$\Rightarrow 5p - 10 = 4 \quad \Rightarrow \quad 5p = 4 + 10 \quad \Rightarrow \quad 5p = 14$$

$$\Rightarrow p = \frac{14}{5}$$

$$(b) \quad -4 = 5(p-2) \quad \Rightarrow \quad -4 = 5 \times p - 5 \times 2 \quad \Rightarrow \quad -4 = 5p - 10$$

$$\Rightarrow 5p - 10 = -4 \quad \Rightarrow \quad 5p = -4 + 10 \quad \Rightarrow \quad 5p = 6$$

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

$$\begin{array}{ll}
 \text{(c) } -16 = -5(2 - p) & \Rightarrow -16 = -5 \times 2 - (-5) \times p \\
 \Rightarrow -16 = -10 + 5p & \Rightarrow -10 + 5p = -16 \\
 \Rightarrow 5p = -16 + 10 & \Rightarrow 5p = -6 \\
 \Rightarrow p = \frac{-6}{5} &
 \end{array}$$

$$\begin{array}{ll}
 \text{(d) } 10 = 4 + 3(t + 2) & \Rightarrow 10 - 4 = 3(t + 2) \\
 \Rightarrow 6 = 3(t + 2) & \Rightarrow \frac{6}{3} = t + 2 \\
 \Rightarrow 2 = t + 2 & \Rightarrow 2 - 2 = t \\
 \Rightarrow 0 = t & \Rightarrow t = 0
 \end{array}$$

$$\begin{array}{ll}
 \text{(e) } 28 = 4 + 3(t + 5) & \Rightarrow 28 - 4 = 3(t + 5) \\
 \Rightarrow 24 = 3(t + 5) & \Rightarrow \frac{24}{3} = t + 5 \\
 \Rightarrow 8 = t + 5 & \Rightarrow 8 - 5 = t \\
 \Rightarrow 3 = t & \Rightarrow t = 3
 \end{array}$$

$$\begin{array}{ll}
 \text{(f) } 0 = 16 + 4(m - 6) & \Rightarrow 0 - 16 = 4(m - 6) \\
 \Rightarrow -16 = 4(m - 6) & \Rightarrow \frac{-16}{4} = m - 6 \\
 \Rightarrow -4 = m - 6 & \Rightarrow -4 + 6 = m \\
 \Rightarrow 2 = m & \Rightarrow m = 2
 \end{array}$$

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

Class -VII Mathematics (Ex. 4.4)
Questions

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 $\frac{11}{2}$.
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?
3. Solve the following:
 - (a) 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?
 - (b) Laxmi's father is 49 years old. He is 4 years older than three times Laxmi's age. What is Laxmi's age?
 - (c) 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?
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!

Class -VII Mathematics (Ex. 4.4)

Answers

1. (a) Let the number be x .

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

$$\Rightarrow 8x = 60 - 4 \quad \Rightarrow 8x = 56$$

$$\Rightarrow x = \frac{56}{8} \quad \Rightarrow x = 7$$

- (b) Let the number be y .

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

$$\Rightarrow \frac{y}{5} = 3 + 4 \quad \Rightarrow \frac{y}{5} = 7$$

$$\Rightarrow y = 7 \times 5 \quad \Rightarrow y = 35$$

- (c) Let the number be z .

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

$$\Rightarrow \frac{3}{4}z = 21 - 3 \quad \Rightarrow \frac{3}{4}z = 18 \quad \Rightarrow 3z = 18 \times 4$$

$$\Rightarrow 3z = 72 \quad \Rightarrow z = \frac{72}{3} \quad \Rightarrow z = 24$$

- (d) Let the number be x .

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

$$\Rightarrow 2x = 15 + 11 \quad \Rightarrow 2x = 26$$

$$\Rightarrow x = \frac{26}{2} \quad \Rightarrow x = 13$$

- (e) Let the number be m .

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

$$\Rightarrow -3m = 8 - 50 \quad \Rightarrow -3m = -42$$

$$\Rightarrow m = \frac{-42}{-3} \quad \Rightarrow m = 14$$

- (f) Let the number be n .

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

$$\Rightarrow n + 19 = 8 \times 5 \quad \Rightarrow n + 19 = 40$$

$$\Rightarrow n = 40 - 19 \quad \Rightarrow n = 21$$

- (g) Let the number be x .

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

$$\begin{aligned}
\Rightarrow \frac{5}{2}x &= \frac{11}{2} + 7 & \Rightarrow \frac{5}{2}x &= \frac{11+14}{2} \\
\Rightarrow \frac{5}{2}x &= \frac{25}{2} & \Rightarrow 5x &= \frac{25 \times 2}{2} & \Rightarrow 5x &= 25 \\
\Rightarrow x &= \frac{25}{5} & \Rightarrow x &= 5
\end{aligned}$$

2. (a) Let the lowest marks be y .

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

$$\begin{aligned}
\Rightarrow 2y &= 87 - 7 & \Rightarrow 2y &= 80 & \Rightarrow y &= \frac{80}{2} \\
\Rightarrow y &= 40
\end{aligned}$$

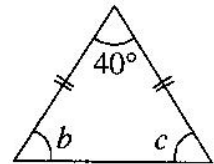
Thus, the lowest score is 40.

- (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]

$$\begin{aligned}
\Rightarrow 40^\circ + b + b &= 180^\circ \\
\Rightarrow 40^\circ + 2b &= 180^\circ \\
\Rightarrow 2b &= 180^\circ - 40^\circ & \Rightarrow 2b &= 140^\circ \\
\Rightarrow b &= \frac{140^\circ}{2} & \Rightarrow b &= 70^\circ
\end{aligned}$$



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, $x + 2x = 198$

$$\begin{aligned}
\Rightarrow 3x &= 198 & \Rightarrow x &= \frac{198}{3} \\
\Rightarrow x &= 66
\end{aligned}$$

Thus, Rahul's score = 66 runs

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

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

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

$$\begin{aligned}
\Rightarrow 5m &= 37 - 7 & \Rightarrow 5m &= 30 \\
\Rightarrow m &= \frac{30}{5} & \Rightarrow m &= 6
\end{aligned}$$

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, $3y + 4 = 49$

$$\Rightarrow 3y = 49 - 4 \quad \Rightarrow 3y = 45$$

$$\Rightarrow y = \frac{45}{3} \qquad \Rightarrow y = 15$$

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, $t + 3t + 2 = 102$

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

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

$$\Rightarrow t = 25$$

Thus, the number of fruit trees are 25.

4. Let the number be n .

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

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

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

$$\Rightarrow n = 30$$

Thus, the required number is 30.