

NCERT SOLUTIONS

CLASS - 7TH



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Class : 7th
Subject : Maths
Chapter : 4
Chapter Name : Simple Equations

Exercise 4.1

Q1 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)	$5x = 25$	$x = -5$	-
(ix)	$\frac{m}{3} = 2$	$m = -6$	-
(x)	$\frac{m}{3} = 2$	$m = 0$	-
(xi)	$\frac{m}{3} = 2$	$m = 6$	-

Answer. L.H.S. = $x + 3$

By putting $x = 3$,

L.H.S. = $3 + 3 = 6 \neq$ R.H.S

No, the equation is not satisfied.

(ii) $x + 3 = 0$

L.H.S. = $x + 3$

By putting $x = 0$,

L.H.S. = $0 + 3 = 3 \neq$ R.H.S.

No, the equation is not satisfied.

(iii) $x + 3 = 0$

L.H.S. = $x + 3$

By putting $x = -3$,

L.H.S. = $-3 + 3 = 0$ R.H.S.

Yes, the equation is satisfied.

(iv) $x - 7 = 0$

L.H.S. = $x - 7$

By putting $x = 7$,

L.H.S. = $7 - 7 = 0 \neq$ R.H.S.

No, the equation is not satisfied.

(v) $x - 7 = 1$

L.H.S. = $x - 7$

By putting $x = 8$,

L.H.S. = $8 - 7 = 1$ R.H.S.

Yes, the equation is satisfied.

(vi) $5x = 25$

L.H.S. = $5x$

By putting $x = 0$, $0 \neq$

L.H.S. R.H.S.

No, the equation is not satisfied.

(vii) $5x = 25$

L.H.S. = $5x$

By putting $x = 5$,

L.H.S. = $5 \times 5 = 25$ R.H.S.

Yes, the equation is satisfied.

(viii) $5x = 25$

L.H.S. = $5x$

By putting $x = (5, 5) = 25 \neq$

L.H.S. R.H.S.

No, the equation is not satisfied.

(ix) $m/3 = 2$

L.H.S = $m/3$

$$= \frac{-6}{3} = -2$$

No, the equation is not satisfied.

By putting $m = -6$,

(x) $m/3 = 2$

L.H.S = $m/3$ R.H.S

By putting $m = 0$,

L.H.S = $\frac{-0}{3} = 0$ R.H.S

No, the equation is not satisfied.

(x) $m/3 = 2$

L.H.S = $m/3$

By putting $m = 6$,

$$\text{L.H.S} = \frac{6}{3} = 2 \text{ R.H.S}$$

Yes, the equation is satisfied.

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Q2 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. (a) $n + 5 = 19$ ($n = 1$)

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

$$n + 5 = 1 + 5 = 6 \neq 19$$

As L.H.S \neq R. H. S.

Therefore, $n = 1$ is not a solution of the given equation, $n + 5 = 19$.

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

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

$$7n + 5 = 7 \times (-2) + 5 = -14 + 5 = -9 \neq 19$$

As L.H.S \neq R. H. S.

Therefore, $n = -2$ is not a solution of the given equation, $7n + 5 = 19$.

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

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

$$7n + 5 = 7 \times (2) + 5 = 14 + 5 = 19 = \text{R.H.S}$$

As L.H.S = R.H.S.

Therefore, $n = 2$ is a solution of the given equation, $7n + 5 = 19$.

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

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

$$4p - 3 = (4 \times 1) - 3 = 1 \neq 13$$

As L.H.S \neq R. H. S.

Therefore, $p = 1$ is not a solution of the given equation, $4p - 3 = 13$.

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

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

$$4p - 3 = 4 \times (-4) - 3 = -16 - 3 = -19 \neq 13$$

As L.H.S \neq R. H. S.

Therefore, $p = -4$ is not a solution of the given equation, $4p - 3 = 13$.

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

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

$$4p - 3 = (4 \times 0) - 3 = -3 \neq 13$$

As L.H.S \neq R. H. S.

Therefore, $p = 0$ is not a solution of the given equation, $4p - 3 = 13$.

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Q3 Solve the following equations by trial and error method:

(i) $5p + 2 = 17$ (ii) $3m - 14 = 4$

Answer. (i) $5p + 2 = 17$

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

$$(5 \times 1) + 2 = 7 \neq R. H. S.$$

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

$$(5 \times 2) + 2 = 10 + 2 = 12 \neq R. H. S.$$

Putting $p = 3$ in L.H.S.,

$$(5 \times 3) + 2 = 17 = R. H. S.$$

Hence, $p = 3$ is a solution of the given equation.

(ii) $3m - 14 = 4$

Putting $m = 4$,

$$(3 \times 4) - 14 = -2 \neq R. H. S.$$

Putting $m = 5$,

$$(3 \times 5) - 14 = 1 \neq R. H. S.$$

Putting $m = 6$,

$$(3 \times 6) - 14 = 18 - 14 = 4 = R. H. S.$$

Hence, $m = 6$ is a solution of the given equation.

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Q4 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. (i) $x + 4 = 9$

(ii) $y - 2 = 8$

(iii) $10a = 70$

(iv) $\frac{b}{5} = 6$

(v) $\frac{3}{4}t = 15$

(vi) Seven times of m is 7m.

$$7m + 7 = 77$$

(vii) One-fourth of a number x is $x/4$.

$$\frac{x}{4} - 4 = 4$$

(viii) Six times of y is 6y.

$$6Y - 6 = 60$$

(ix) One-third of z is $z/3$

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

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Q5 Write the following equations in statement forms:

(i) $p + 4 = 15$

(ii) $m - 7 = 3$

(iii) $2m = 7$

(iv) $m/5 = 3$

(v) $3 + 5m = 6$

(vi) $3p + 4 = 25$

(vii) $4p - 2 = 18$

(viii) $p/2 + 2 = 8$

Answer. (i) The sum of p and 4 is 15.

(ii) 7 subtracted from m is 3.

(iii) Twice of a number m is 7.

(iv) One-fifth of m is 3.

(v) Three-fifth of m is 6.

(vi) Three times of a number p, when added to 4, gives 25.

(vii) When 2 is subtracted from four times of a number p, it gives 18.

(viii) When 2 is added to half of a number p, it gives 8.

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Q6 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 is 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 degrees).

Answer. (i) Let Parmit has m marbles.

5 x Number of marbles Parmit has + 7 = Number of marbles Irfan has

$$5x + 7 = 37$$

$$5m + 7 = 37$$

(ii) Let Laxmi be y years old.

3 x Laxmi's age + 4 = Laxmi's father's age

$$3x + 4 = 49$$

$$3 + 4 = 49$$

(iii) Let the lowest marks be l .

2 x Lowest marks + 7 = Highest marks

$$2x + 7 = 87$$

$$2l + 7 = 87$$

(iv) An isosceles triangle has two of its angles of equal measure.

Let base angle be b .

Vertex angle = 2 x Base angle = $2b$

Sum of all interior angles of a $\Delta = 180^\circ$

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

$$4b = 180^\circ$$

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Exercise 4.2

Q1 Give first the step you will use to separate the variable and then solve the equation: (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. (a) $x + 1 = 0$

Subtracting 1 to both sides of the given equation, we obtain

$$x + 1 - 1 = 0 - 1$$

$$x = -1$$

(b) $x - 1 = 0$

Adding 1 to both sides of the given equation, we obtain

$$x - 1 + 1 = 0 + 1$$

$$x = 1$$

(c) $x - 1 = 5$

Adding 1 to both sides of the given equation, we obtain

$$x - 1 + 1 = 5 + 1$$

$$x = 6$$

$$(d) x + 6 = 2$$

Subtracting 6 to both sides of the given equation, we obtain

$$x + 6 - 6 = 2 - 6$$

$$x = -4$$

$$(e) y - 4 = -7$$

Adding 4 to both sides of the given equation, we obtain

$$y - 4 + 4 = -7 + 4$$

$$y = -3$$

$$(f) y - 4 = 4$$

Adding 4 to both sides of the given equation, we obtain

$$y - 4 + 4 = 4 + 4$$

$$y = 8$$

$$(g) y + 4 = 4$$

Subtracting 4 to both sides of the given equation, we obtain

$$y + 4 - 4 = 4 - 4$$

$$y = 0$$

$$(g) y + 4 = -4$$

Subtracting 4 to both sides of the given equation, we obtain

$$y + 4 - 4 = -4 - 4$$

$$y = -8$$

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Q2 Give first the step you will use to separate the variable and then solve the equation: (a) $3l = 42$

$$(b) b/2 = 6$$

$$(c) p/7 = 4$$

$$(d) 4x = 25$$

$$(e) 8y = 36$$

$$(f) z/3 = 5/4$$

$$(g) a/5 = 7/15$$

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

Answer. (a) $3l = 42$

Dividing both sides of the given equation by 3, we obtain

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

$$l = 14$$

$$(b) b/2 = 6$$

Multiplying both sides of the given equation by 2, we obtain

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

$$b = 12$$

(c) $p/7 = 4$

Multiplying both sides of the given equation by 7, we obtain

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

$$p = 28$$

(d) $4x = 25$

Dividing both sides Of the given equation by 4, we obtain

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

$$\frac{25}{4}$$

(e) $8y = 36$

Dividing both sides of the given equation by 8, we obtain

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

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

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

Multiplying both sides of the given equation by 3, we obtain

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

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

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

Multiplying both sides of the given equation by 5, we obtain

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

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

(h) $20t = -10$

Dividing both sides of the given equation by 20, we obtain

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

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

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Q3 Give the steps you will use to separate the variable and then solve the equation:

(a) $3n - 2 = 46$

(b) $5m + 7 = 17$

(c) $20p/3 = 40$

(d) $3p/10 = 6$

Answer. (a) The given equation is $3n - 2 = 46$

Add 2 to both sides,

$$3n - 2 + 2 = 46 + 2 \Rightarrow 3n = 48$$

Divide both sides by 3,

$$\frac{3n}{3} = \frac{48}{3} \Rightarrow n = 16$$

It is the required solution. For Checking, put $n = 16$ in the given equation.

L.H.S = $3n - 2 = 3 \times 16 - 2 = 48 - 2 = 46 =$ R. H. S. as required. Hence the solution is correct.

(b) The given equation is $5m + 7 = 17$

Subtract 7 from both the sides

$$5m + 7 - 7 = 17 - 7 \Rightarrow 5m = 10$$

Divide both sides by 5

$$\frac{5m}{5} = \frac{10}{5} \Rightarrow m = 2$$

It is the required solution. For checking, put $m=2$ in the given equation.

L.H.S = $5m + 7 = 5 \times 2 + 7 = 10 + 7 = 17 =$ R. H. S. as required. Hence the solution is correct.

(c) The given equation is $\frac{20p}{3} = 40$

Multiply both sides by 3, $\frac{20p}{3} \times 3 = 40 \times 3 \Rightarrow 20p = 120$

Divide both sides by 20

$$\frac{20p}{20} = \frac{120}{20} \Rightarrow p = 6$$

It is the required solution. For checking, put $p = 6$ in the given equation.

L.H.S = $\frac{20p}{3} = \frac{20 \times 6}{3} = 40 =$ R. H. S as required. Hence the solution is correct.

(d) $3p/10 = 6$

Dividing both sides of the given equation by 3, we obtain

$$\frac{3p}{3} = \frac{60}{3}$$

$$p=20$$

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Q4 Solve the following equations:

(a) $10p = 100$

(b) $10p + 10 = 100$

(c) $p/4 = 5$

(d) $-p/3 = 5$

(e) $3p/4 = 6$

(f) $3s = -9$

(g) $3s + 12 = 0$

(h) $3s = 0$

(j) $2q - 6 = 0$

(k) $2q + 6 = 0$

(l) $2q + 6 = 12$

Answer. (a) $10p = 100$

$$\frac{10p}{10} = \frac{100}{10}$$

$$p = 10$$

(b) $10p + 10 = 100$

$$10p + 10 - 10 = 100 - 10$$

$$10p = 90$$

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

$$p = 9$$

(c) $p/4 = 5$

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

$$p = 20$$

(d) $-p/3 = 5$

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

$$p = -15$$

(e) $3p/4 = 6$

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

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

$$3p = 24$$

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

$$p = 8$$

(f) $3s = -9$

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

$$s = -3$$

(g) $3s + 12 = 0$

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

$$3s = -12$$

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

$$s = -4$$

(h) $3s = 0$

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

$$s = 0$$

(i) $2q = 6$

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

$$q = 3$$

(j) $2q - 6 = 0$

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

$$2q = 6$$

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

$$q = 3$$

(k) $2q + 6 = 0$

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

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$$2q = -6$$

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

$$q = -3$$

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

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

$$2q = 6$$

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

$$q = 3$$

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Exercise 4.3

Q1 Solve the following equations:

$$(a) 2y + \frac{5}{2} = \frac{37}{2} \quad (b) 5t + 28 = 10 \quad (c) \frac{a}{5} + 3 = 2 \quad (d) \frac{q}{4} + 7 = 5$$

$$(e) \frac{5}{2}x = -5 \quad (f) \frac{5}{2}x = \frac{25}{4} \quad (g) 7m + \frac{19}{2} = 13 \quad (h) 6z + 10 = -2$$

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

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

$$2y = \frac{37}{2} - \frac{5}{2} = \frac{32}{2} = 16 \text{ (Transposing } 5/2 \text{ to R.H.S)}$$

Dividing both sides by 2,

$$y = 16/2 = 8$$

(b) $5t + 28 = 10$

$$5t = 10 - 28 = -18 \text{ (Transposing } 28 \text{ to R.H.S)}$$

Dividing both sides by 5,

$$t = -18/5$$

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

$$\frac{a}{5} = 2 - 3 = -1 \text{ (Transposing } 3 \text{ to R.H.S)}$$

Multiplying both sides by 5,

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

$$q/4 = -2 \text{ (Transposing } 7 \text{ to R.H.S)}$$

Multiplying both sides by 4,

$$q = -8$$

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

Multiplying both sides by 2,

$$5x = -10 \times 2 = -20$$

Dividing both sides by 5,

$$x = \frac{-20}{5} = -4$$

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

Multiplying both sides by 2,

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

Multiplying both sides by 5,

$$x = \frac{25}{2} \times \frac{1}{5} = \frac{5}{2}$$

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

$$7m = 13 - \frac{19}{2} = \frac{26-19}{2} \text{ (Transposing } 19/2 \text{ to R.H.S)}$$

$$7m = 7/2$$

Dividing both sides by 7,

$$m = 1/2$$

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

$$6z = -2 - 10 = -12 \text{ (Transposing } 10 \text{ to R.H.S.)}$$

Dividing both sides by 6,

$$z = \frac{-12}{6} = -2$$

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

Multiplying both sides by 2,

$$3l = \frac{2}{3} \times 2 = \frac{4}{3}$$

Dividing both sides by 3,

$$l = \frac{4}{3} \times \frac{1}{3} = \frac{4}{9}$$

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

$$\frac{2b}{3} = 3 + 5 = 8 \text{ (Transposing } -5 \text{ to R.H.S.)}$$

Multiplying both sides by 3,

$$2b = 8 \times 3 = 24$$

Dividing both sides by 2,

$$b = 24/2 = 12$$

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Q2 Solve the following equations:

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

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

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

$$(d) -4(2 + x) = 8$$

$$(e) 4(2 - x) = 8$$

Answer.

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

Dividing both sides by 2

$$x + 4 = \frac{12}{2} = 6$$

$$x = 6 - 4 = 2 \text{ (Transposing 4 to R.H.S.)}$$

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

Dividing both sides by 3

$$n - 5 = \frac{21}{3} = 7$$

$$n = 7 + 5 = 12 \text{ (Transposing } -5 \text{ to R.H.S.)}$$

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

Dividing both sides by 3

$$n - 5 = \frac{-21}{3} = -7$$

$$n = -7 + 5 = -2 \text{ (Transposing } -5 \text{ to R.H.S.)}$$

$$(d) -4(2 + x) = 8$$

Dividing both sides by -4

$$2 + x = \frac{8}{-4} = -2$$

$$x = -2 - 2 = -4 \text{ (Transposing 2 to R.H.S.)}$$

$$(e) 4(2 - x) = 8$$

Dividing both sides by 4

$$2 - x = 2$$

$$-x = 2 - 2 \text{ (Transposing 2 to R.H.S.)}$$

$$-x = 0$$

$$x = 0$$

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Q3 Solve the following equations:

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

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

$$(c) 16 = 4 + 3(t + 2)$$

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

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

Answer.

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

Dividing both sides by 5

$$\frac{4}{5} = p - 2$$

$$\frac{4}{5} + 2 = p \text{ (Transposing } -2 \text{ to L.H.S.)}$$

$$\frac{4+10}{5} = p$$

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

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

Dividing both sides by 5,

$$-\frac{4}{5} = p - 2$$

$$-\frac{4}{5} + 2 = p \quad (\text{Transposing } -2 \text{ to L. H.S.})$$

$$\frac{-4+10}{5} = p$$

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

$$(c) 16 = 4 + 3(t + 2)$$

$$16 - 4 = 3(t + 2) \quad (\text{Transposing } 4 \text{ to L.H.S.})$$

$$12 = 3(t + 2)$$

Dividing both sides by 3 ,

$$\frac{12}{3} = t + 2$$

$$4 = t + 2$$

$$4 - 2 = t \quad (\text{Transposing } 2 \text{ to L.H.S.})$$

$$2 = t$$

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

$$5(p - 1) = 34 - 4 = 30 \quad (\text{Transposing } 4 \text{ to R.H.S.})$$

Dividing both sides by 5

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

$$p = 6 + 1 = 7 \quad (\text{Transposing } -1 \text{ to R.H.S.})$$

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

$$0 = 16 + 4m - 24$$

$$0 = -8 + 4m$$

$$4m = 8 \quad (\text{Transposing } -8 \text{ to L.H.S.})$$

Dividing both sides by 4 ,

$$m = 2$$

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Q4 (a) Construct 3 equations starting with $x = 2$

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

Answer.

$$(a) x = 2$$

Multiplying both sides by 5,

$$5x = 10 \text{ (i)}$$

Subtracting 3 from both sides,

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

$$5x - 3 = 7 \text{ (ii)}$$

Dividing both sides by 2 ,

$$\frac{5x}{2} - \frac{3}{2} = \frac{7}{2} \text{ (iii)}$$

>br/>

$$(b) x = -2$$

Subtracting 2 from both sides,

$$x - 2 = -2 - 2$$

$$x - 2 = -4 \text{ (i)}$$

Again, $x = -2$

Multiplying by 6

$$6 \times x = -2 \times 6$$

$$6x = -12$$

Subtracting 12 from both sides,

$$6x - 12 = -12 - 12$$

$$6x - 12 = -24 \text{ (ii)}$$

Adding 24 to both sides,

$$6x - 12 + 24 = -24 + 24$$

$$6x + 12 = 0 \text{ (iii)}$$

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Exercise 4.4

Q1 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-fourths 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 and divides the sum by 5, she will get 8.

(g) Anwar thinks of a number. If he takes away 7 from 5 2 of the number, the result is 23.

Answer.

(a) Let the number be x .

$$8 \text{ times of this number} = 8x$$

$$8x + 4 = 60$$

$$8x = 60 - 4 \text{ (Transposing 4 to R.H.S.)}$$

$$8x = 56$$

Dividing both sides by 8

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

$$x = 7$$

(b) Let the number be x .

$$\text{One-fifth of this number} = \frac{x}{5}$$

$$\frac{x}{5} - 4 = 3$$

$$\frac{x}{5} - 4 = 3$$

$$\frac{x \times 5}{5} = 7 \times 5$$

$$x = 35$$

(c) Let the number be x .

$$\text{Three-fourth of this number} = = \frac{3x}{4}$$

$$\frac{3}{4}x + 3 = 21$$

$$\frac{3}{4}x = 18$$

(Transposing 3 to R.H.S.)

Multiplying both sides by 4 ,

$$\frac{3x \times 4}{4} = 18 \times 4$$

$$3x = 72$$

Dividing both sides by 3,

$$\frac{3x}{3} = \frac{72}{3}$$

$$x = 24$$

(d) Let the number be x .

$$\text{Twice of this number} = 2x$$

$$2x - 11 = 15$$

$$2x = 15 + 11 \text{ (Transposing } - 11 \text{ to R.H.S.)}$$

$$2x = 26$$

Dividing both sides by 2 ,

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

$$x = 13$$

(e) Let the number of books be x .

Thrice the number of books = $3x$

$$50 - 3x = 8$$

$$-3x = 8 - 50 \text{ (Transposing 50 to R.H.S.)}$$

$$-3x = -42$$

Dividing both sides by -3 ,

$$\frac{-3x}{-3} = \frac{-42}{-3}$$

$$x = 4$$

(f) Let the number be x .

$$\frac{x+19}{5} = 8$$

Multiplying both sides by 5

$$\frac{(x+19) \times 5}{5} = 8 \times 5$$

$$x + 19 = 40$$

$$x = 40 - 19 \text{ (Transposing 19 to R.H.S.)}$$

$$x = 21$$

(g) Let the number be x .

$$\frac{5}{2} \text{ of this number} = \frac{5x}{2}$$

$$\frac{5x}{2} - 7 = 23$$

$$\frac{5x}{2} = 23 + 7 \text{ (Transposing } -7 \text{ to R. H. S)}$$

$$\frac{5x}{2} = 30$$

Multiplying both sides by 2

$$\frac{5x \times 2}{2} = 30 \times 2$$

$$5x = 60$$

Dividing both sides by 5,

$$\frac{5x}{5} = \frac{60}{5}$$

$$x = 12$$

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Q2 Solve the following:

(a) The teacher tells the class that the highest marks obtained by a student in her class is 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. (a) Let the lowest score be l .

$2 \times \text{Lowest marks} + 7 = \text{Highest marks}$

$$21 + 7 = 87$$

$$21 = 87 - 7 \text{ (Transposing 7 to R.H.S.)}$$

$$21 = 80$$

Dividing both sides by 2,

$$\frac{2l}{2} = \frac{80}{2}$$

$$l = 40$$

Therefore, the lowest score is 40.

(b) Let the base angles be equal to b .

The sum of all interior angles of a triangle is 180°

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

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

$$2b = 180^\circ - 40^\circ = 140^\circ \text{ (Transposing } 40^\circ \text{ to R.H.S.)}$$

Dividing both sides by 2,

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

$$b = 70^\circ$$

Therefore, the base angles of the triangle are of 70° measure.

(c) Let Rahul's score be x .

Therefore, Sachin's score = $2x$

$$\text{Rahul's score} + \text{Sachin's score} = 200 - 2$$

$$2x + x = 198$$

$$3x = 198$$

Dividing both sides by 3,

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

$$x = 66$$

$$\text{Rahul's score} = 66$$

$$\text{sachin's score} = 2 \times 66 = 132$$

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Q3 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 Sundargram planted 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 if the number of non-fruit trees planted was 77?

Answer. (i) Let Parmit's marbles equal x .

5 times the number of marbles Parmit has = $5x$

$$5x + 7 = 37$$

$$5x - 37 - 7 = 30 \text{ (Transposing 7 to R.H.S.)}$$

Dividing both sides by 5.

$$\frac{5x}{5} = \frac{30}{5}$$

$$x = 6$$

(ii) Let Laxmi's age be x years.

3 x Laxmi's age + 4 = Her father's age

$$3x + 4 = 49$$

$$3x = 49 - 4 \text{ (Transposing 4 to R.H.S.)}$$

$$3x = 45$$

Dividing both Sides by 3,

$$\frac{3x}{3} = \frac{45}{3}$$

$$x = 15$$

Therefore, Laxmi's age is 15 years.

(iii) Let the number of fruit trees be x .

3 x Number Of fruit trees + 2 = Number of non-fruit trees

$$3x + 2 = 77$$

$$3x = 77 - 2 \text{ (Transposing 2 to R.H.S.)}$$

$$3x = 75$$

Dividing both sides of the equation by 3,

$$\frac{3x}{3} = \frac{75}{3}$$

$$x = 25$$

Therefore, the number of fruit trees was 25.

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Q4 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. Let the number be x .

$$(7x + 50) + 40 = 300$$

$$7x + 90 = 300$$

$$7x = 300 - 90 \text{ (Transposing 90 to R.H.S.)}$$

$$7x = 210$$

Dividing both sides by 7,

$$\frac{7x}{7} = \frac{210}{7}$$

$$x = 30$$

Therefore, the number is 30.

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