Mathematics

(Chapter - 4) (Simple Equations) (Exercise 4.1) (Class - VII)

Question 1:	ast 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 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

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
(ix)	$\frac{m}{3}=2$	m=-6	No
(x)	$\frac{m}{3} = 2$	m = 0	No
(Xi)	$\frac{m}{3}=2$	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)
$$4p-3=13(p=0)$$

Answer2:

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

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

$$1 + 5 = 6$$

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

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

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

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

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. $5(-3)+2 = -15+2=-13$

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

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

∴
$$-8 \neq 17$$
 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. $5(3)+2=15+2=17$

:
$$17=17$$
 Therefore, $p=3$ is the solution.

(ii)
$$3m-14=4$$

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

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

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

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

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

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

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

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

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

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

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

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

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

∴
$$-2 \neq 4$$
 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)
$$\frac{b}{5} = 6$$

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

(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) $\frac{m}{5} = 3$
- $\frac{3m}{5} = 6$
- (vi) 3p+4=25
- (vii) 4p-2=18
- $(viii) \qquad \frac{p}{2} + 2 = 8$

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. (Tale 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 1.)
- (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.

$$3y+4=49$$

(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]

Mathematics

(Chapter - 4) (Simple Equations) (Exercise 4.2) (Class - VII)

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

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

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]

(d) x+6=2

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

 $\Rightarrow x = -4$

 $\Rightarrow x=6$

[Subtracting 6 both sides]

(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)
$$3l = 42$$

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

$$\Rightarrow l = 14$$

[Dividing both sides by 3]

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

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

$$\Rightarrow b=12$$

[Multiplying both sides by 2]

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

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

$$\Rightarrow p=28$$

[Multiplying both sides by 7]

(d)
$$4x = 25$$

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

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

(e) 8y = 36

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

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

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

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

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

[Dividing both sides by 8]

[Multiplying both sides by 3]

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

Step I:
$$3n-2+2=46+2$$

$$\Rightarrow$$
 3n=48

[Adding 2 both sides]

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

$$\Rightarrow n=16$$

[Dividing both sides by 3]

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

$$5m+7-7=17-7$$

$$\Rightarrow$$
 5 $m=10$

[Subtracting 7 both sides]

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

$$\Rightarrow m=2$$

[Dividing both sides by 5]

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

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

$$\Rightarrow 20p = 120$$

[Multiplying both sides by 3]

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

$$\Rightarrow p = 6$$

[Dividing both sides by 20]

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

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

$$\Rightarrow 3p = 60$$

[Multiplying both sides by 10]

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

$$\Rightarrow p = 20$$

[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)
$$2q+6=0$$

(1)
$$2q+6=12$$

Answer 4:

(a)
$$10p = 100$$

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

$$\Rightarrow p = 10$$

[Dividing both sides by 10]

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

$$\Rightarrow 10p+10-10=100-10$$

[Subtracting both sides 10]

$$\Rightarrow 10p = 90$$

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

 $\Rightarrow p=9$

[Dividing both sides by 10]

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

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

[Multiplying both sides by 4]

$$\Rightarrow p = 20$$

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

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

$$\Rightarrow p = -15$$

[Multiplying both sides by - 3]

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

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

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

[Multiplying both sides by 4]

$$\Rightarrow 3p = 24$$

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

[Dividing both sides by 3]

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

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

[Dividing both sides by 3]

$$\Rightarrow s = -3$$
(g) $3s+12=0$

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

$$\Rightarrow 3s=-12$$

[Subtracting both sides 10]

 $\Rightarrow 3s = -12$ $\Rightarrow \frac{3s}{3} = \frac{-12}{3}$ $\Rightarrow s = -4$

[Dividing both sides by 3]

(h)
$$3s = 0$$

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

$$\Rightarrow s = 0$$

[Dividing both sides by 3]

(i)
$$2q = 6$$

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

$$\Rightarrow q = 3$$

[Dividing both sides by 2]

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

 $\Rightarrow 2q-6+6=0+6$
 $\Rightarrow 2q=6$
 $\Rightarrow \frac{2q}{2} = \frac{6}{2}$
 $\Rightarrow q=3$

[Adding both sides 6]

[Dividing both sides by 2]

(k) 2q+6=0 $\Rightarrow 2q+6-6=0-6$ [Subtracting both sides 6] $\Rightarrow 2q=-6$

 $\Rightarrow \frac{2q}{2} = \frac{-6}{2}$ $\Rightarrow q = -3$ [Dividing both sides by 2]

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

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

 $\Rightarrow 2q=6$

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

$$\Rightarrow q=3$$

[Subtracting both sides 6]

[Dividing both sides by 2]

Mathematics

(Chapter - 4) (Simple Equations) (Exercise 4.3) (Class - VII)

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,
$$8x+4=60$$

 $\Rightarrow 8x=60-4$
 $\Rightarrow 8x=56$
 $\Rightarrow x=\frac{56}{3}$

$$\Rightarrow x=7$$

(b) Let the number be y

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

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

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

$$\Rightarrow$$
 $y=7\times5$

$$\Rightarrow$$
 $y = 35$

(c) Let the number be z

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

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

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

$$\Rightarrow$$
 3z=18×4

$$\Rightarrow$$
 3z = 72

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

$$\Rightarrow$$
 $z = 24$

(d) Let the number be x

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

$$\Rightarrow 2x=26$$

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

$$\Rightarrow x=13$$

$$2x-11=15$$

(e) Let the number be m

$$50-3m=8$$

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

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

$$\Rightarrow m = \frac{-42}{2}$$

$$\Rightarrow m=14$$

(f) Let the number be n

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

$$\Rightarrow n+19=8\times5$$

$$\Rightarrow n+19=40$$

$$\Rightarrow n = 40 - 19$$

$$\Rightarrow n=21$$

(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,

$$2y+7=87$$

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

$$\Rightarrow 2y = 80$$

$$\Rightarrow$$
 $y = \frac{30}{2}$

$$\Rightarrow$$
 $y = 40$

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 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 3:

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

$$5m+7=37$$

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

$$\Rightarrow$$
 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

$$\Rightarrow y = \frac{45}{2}$$

$$\Rightarrow$$
 $y=15$

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, 3t + 2 = 77

$$3t + 2 = 77$$

$$\Rightarrow$$
 3t = 75

$$\Rightarrow t = \frac{75}{3}$$

$$\Rightarrow t = 25$$

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.