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

Exercise 4.1

Question 1:
Complete the last column of the table:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Equation</th>
<th>Value</th>
<th>Say, whether the Equation is satisfied. (Yes / No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i)</td>
<td>$x + 3 = 0$</td>
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<td></td>
</tr>
<tr>
<td>(ii)</td>
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<td></td>
</tr>
<tr>
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<td></td>
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<tr>
<td>(iv)</td>
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<td>$x = 7$</td>
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<tr>
<td>(v)</td>
<td>$x - 7 = 1$</td>
<td>$x = 8$</td>
<td></td>
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<tr>
<td>(vi)</td>
<td>$5x = 25$</td>
<td>$x = 0$</td>
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<td>$5x = 25$</td>
<td>$x = -5$</td>
<td></td>
</tr>
<tr>
<td>(viii)</td>
<td>$\frac{m}{3} = 2$</td>
<td>$m = -6$</td>
<td></td>
</tr>
<tr>
<td>(ix)</td>
<td>$\frac{m}{3} = 2$</td>
<td>$m = 0$</td>
<td></td>
</tr>
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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) $4p - 3 = 13 (p = -4)$

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Answer 2:

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

Putting \( n = 1 \) in L.H.S., \( 1 + 5 = 6 \)

\[ \therefore \text{L.H.S.} \neq \text{R.H.S.}, \]

\[ \therefore n = 1 \text{ is not the solution of given equation.} \]

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

Putting \( n = -2 \) in L.H.S., \( 7(-2) + 5 = -14 + 5 = -9 \)

\[ \therefore \text{L.H.S.} \neq \text{R.H.S.}, \]

\[ \therefore n = -2 \text{ is not the solution of given equation.} \]

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

Putting \( n = 2 \) in L.H.S., \( 7(2) + 5 = 14 + 5 = 19 \)

\[ \therefore \text{L.H.S.} = \text{R.H.S.}, \]

\[ \therefore n = 2 \text{ is the solution of given equation.} \]

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

Putting \( p = 1 \) in L.H.S., \( 4(1) - 3 = 4 - 3 = 1 \)

\[ \therefore \text{L.H.S.} \neq \text{R.H.S.}, \]

\[ \therefore p = 1 \text{ is not the solution of given equation.} \]

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

Putting \( p = -4 \) in L.H.S., \( 4(-4) - 3 = -16 - 3 = -19 \)

\[ \therefore \text{L.H.S.} \neq \text{R.H.S.}, \]

\[ \therefore p = -4 \text{ is not the solution of given equation.} \]

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

Putting \( p = 0 \) in L.H.S., \( 4(0) - 3 = 0 - 3 = -3 \)

\[ \therefore \text{L.H.S.} \neq \text{R.H.S.}, \]

\[ \therefore p = 0 \text{ is not the solution of given equation.} \]

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

\[ \therefore -13 \neq 17 \text{ Therefore, } p = -3 \text{ is not the solution.} \]

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

\[ \therefore -8 \neq 17 \text{ Therefore, } p = -2 \text{ is not the solution.} \]

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

\[ \therefore -3 \neq 17 \text{ Therefore, } p = -1 \text{ is not the solution.} \]

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

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

\[ \therefore 2 \neq 17 \quad \text{Therefore, } p = 0 \text{ is not the solution.} \]
Putting \( p = 1 \) in L.H.S. \[ 5(1) + 2 = 5 + 2 = 7 \]
\[ \therefore 7 \neq 17 \quad \text{Therefore, } p = 1 \text{ is not the solution.} \]
Putting \( p = 2 \) in L.H.S. \[ 5(2) + 2 = 10 + 2 = 12 \]
\[ \therefore 12 \neq 17 \quad \text{Therefore, } p = 2 \text{ is not the solution.} \]
Putting \( p = 3 \) in L.H.S. \[ 5(3) + 2 = 15 + 2 = 17 \]
\[ \therefore 17 = 17 \quad \text{Therefore, } p = 3 \text{ is the solution.} \]

(ii) \[ 3m - 14 = 4 \]
Putting \( m = -2 \) in L.H.S. \[ 3(-2) - 14 = -6 - 14 = -20 \]
\[ \therefore -20 \neq 4 \quad \text{Therefore, } m = -2 \text{ is not the solution.} \]
Putting \( m = -1 \) in L.H.S. \[ 3(-1) - 14 = -3 - 14 = -17 \]
\[ \therefore -17 \neq 4 \quad \text{Therefore, } m = -1 \text{ is not the solution.} \]
Putting \( m = 0 \) in L.H.S. \[ 3(0) - 14 = 0 - 14 = -14 \]
\[ \therefore -14 \neq 4 \quad \text{Therefore, } m = 0 \text{ is not the solution.} \]
Putting \( m = 1 \) in L.H.S. \[ 3(1) - 14 = 3 - 14 = -11 \]
\[ \therefore -11 \neq 4 \quad \text{Therefore, } m = 1 \text{ is not the solution.} \]
Putting \( m = 2 \) in L.H.S. \[ 3(2) - 14 = 6 - 14 = -8 \]
\[ \therefore -8 \neq 4 \quad \text{Therefore, } m = 2 \text{ is not the solution.} \]
Putting \( m = 3 \) in L.H.S. \[ 3(3) - 14 = 9 - 14 = -5 \]
\[ \therefore -5 \neq 4 \quad \text{Therefore, } m = 3 \text{ is not the solution.} \]
Putting \( m = 4 \) in L.H.S. \[ 3(4) - 14 = 12 - 14 = -2 \]
\[ \therefore -2 \neq 4 \quad \text{Therefore, } m = 4 \text{ is not the solution.} \]
Putting \( m = 5 \) in L.H.S. \[ 3(5) - 14 = 15 - 14 = 1 \]
\[ \therefore 1 \neq 4 \quad \text{Therefore, } m = 5 \text{ is not the solution.} \]
Putting \( m = 6 \) in L.H.S. \[ 3(6) - 14 = 18 - 14 = 4 \]
\[ \therefore 4 = 4 \quad \text{Therefore, } m = 6 \text{ is the solution.} \]

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) \( \frac{z}{3} + 3 = 30 \)
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(Chapter - 4) (Simple Equations)

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**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.

\[ 5m + 7 = 37 \]

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

\[ 3y + 4 = 49 \]

(iii) Let the lowest score be \( l \).

\[ 2l + 7 = 87 \]

(iv) Let the base angle of the isosceles triangle be \( b \), so vertex angle = \( 2b \).

\[ 2b + b + b = 180° \]

\[ 4b = 180° \]  \[ \text{[Angle sum property of a Δ]} \]