

9/5/20

Ch-2 Linear Equation in one Variable

Q.1 Solving the following equation

(i) $x - 2 = 7$
 $x = 7 + 2$
 $x = 9$

(ii) $y + 3 = 10$
 $y = 10 - 3$
 $y = 7$

(iii) $6 = z + 2$
 $6 - 2 = z$
 $4 = z$

(iv) $\frac{3}{7} + x = \frac{17}{7}$
 $x = \frac{17}{7} - \frac{3}{7}$

(v) $6x = 12$

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

(vi) $\frac{t}{5} = 10$
 $t = 10 \times 5$
 $t = 50$

(vii) $\frac{2x}{3} = 18$
 $x = \frac{18 \times 3}{2}$
 $x = 27$

(viii) $1.6 = \frac{y}{1.5}$
 $1.6 \times 1.5 = y$
 $2.40 = y$

(ix) $7x - 9 = 16$
 $7x = 16 + 9$
 $7x = 25$
 $x = \frac{25}{7}$

(x) $14y - 8 = 13$
 $14y = 13 + 8$
 $14y = 21$
 $y = \frac{21}{14}$
 $y = \frac{3}{2}$

(xi) $17 + 6p = 9$
 $6p = 9 - 17$
 $6p = -8$
 $p = \frac{-8}{6}$
 $p = -\frac{4}{3}$

(xii) $\frac{x}{9} + 1 = \frac{7}{15}$

$\frac{x}{9} = \frac{7}{15} - 1$

$\frac{x}{9} = \frac{7 - 15}{15}$

$\frac{x}{9} = \frac{-8}{15}$

$x = \frac{-8}{15} \times 9 = \frac{-8}{5}$

9/5/20

Ex-2.2

Q:1 If you subtract $\frac{1}{2}$ from a no and multiply the result by $\frac{1}{2}$ you get $\frac{1}{8}$, what is the no.

Ans Let the number = x

ATA

$$\frac{1}{2} \left(x - \frac{1}{2} \right) = \frac{1}{8}$$

$$\left(x - \frac{1}{2} \right) = \frac{1}{8} \times \frac{2}{1}$$

$$x - \frac{1}{2} = \frac{1}{4}$$

$$x = \frac{1}{4} + \frac{1}{2}$$

$$x = \frac{1+2}{4}$$

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

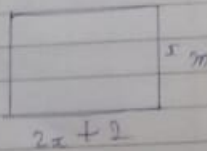
Q:2 The perimeter of a rectangular swimming pool is 154 m, its length and breadth.

Ans $P = 154$ m

let breadth = x m

and length = $2x + 2$ m

$P = 154$



$$2(l+b) = 154$$

$$2(2x+2+x) = 154$$

$$(3x+2) = \frac{154}{2}$$

$$3x+2 = 77$$

$$3x = 77-2$$

$$3x = 75$$

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

$$x = 25$$

$$\text{breadth} = 25 \text{ m}$$

$$\text{length} = 2x+2$$

$$= 2 \times 25 + 2$$

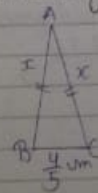
$$= 50 + 2$$

$$= 52 \text{ m}$$

Q:3 The base of an isosceles triangle is $\frac{4}{3}$ cm the perimeter of the triangle is $4\frac{2}{15}$ cm what is the length of either remaining e.g sides

Ans length of base = $\frac{4}{3}$ cm

$$\text{perimeter} = 4\frac{2}{15} \text{ cm}$$



$$AB + AC + BC = \frac{62}{15}$$

$$x + x + \frac{4}{3} = \frac{62}{15}$$

$$2x = \frac{62}{15} - \frac{4}{3}$$

$$2x = \frac{62 - 20}{15}$$

$$2x = \frac{42}{15}$$

$$2x = \frac{42}{15}$$

$$x = \frac{4x}{15} \times \frac{15}{2}$$

$$x = \frac{21}{5}$$

$$x = 7 \text{ km}$$

Q:4 Sum of two numbers is 95. If one exceeds the other by 15. Find the no x.

Let the smaller no = x
and greater no = x + 15

ATQ

$$x + x + 15 = 95$$

$$2x = 95 - 15$$

$$2x = 80$$

$$2 = \frac{80}{2} = 40$$

Smaller no = 40

greater no = x + 15

$$= 40 + 15$$

$$= 55$$

Q:5 Two numbers are in the ratio 5:3. If their difference is 18, what are the numbers?

A Let first no = 5x
and 2nd no = 3x

ATQ

$$5x - 3x = 18$$

$$2x = 18$$

$$x = \frac{18}{2}$$

$$x = 9$$

$$1^{\text{st}} \text{ no} = 5x = 5 \times 9 = 45$$

$$2^{\text{nd}} \text{ no} = 3x = 3 \times 9 = 27$$

Q:6 Three consecutive integers add up to 51, what are integers?

Let 1st Integer = x

2nd Integer = x + 1

3rd Integer = x + 2

ATQ

$$x + x + 1 + x + 2 = 51$$

$$3x + 3 = 51$$

$$3x = 51 - 3$$

$$3x = 48$$

$$x = \frac{48}{3} = 16$$

$$x = 16$$

15/20

Q. 9 The ages of Rahul and Harron are in the ratio 5:7. Four years later the sum of their ages will be 56 years. What is their present age?

Ans let present age of Rahul = $5x$
and present age of Harron = $7x$
after four years years
age of Rahul = $5x + 4$ years
age of Harron = $7x + 4$ years

ATQ

$$\begin{array}{rcl}
 5x + 4 + 7x + 4 & = & 56 \\
 12x + 8 & = & 56 \\
 12x & = & 56 - 8 \\
 & = & 48 \\
 12x & = & 48 \\
 x & = & \frac{48}{12} \\
 & = & 4
 \end{array}$$

Rahul's present age = $5x$
 Harron " " = $5 \times 4 = 20$ years
 Harron " " = $7x$
 = 7×4

Q. 10 The number of boys and girls in a class is in ratio 7:5. The no. of boys is 3 more than the girls. What is total class strength?

Ans let the no. of boys = $7x$
let " " girls = $5x$

ATQ

$$\begin{array}{rcl}
 \text{No. of boys} & = & \text{No. of girls} + 3 \\
 7x & = & 5x + 3 \\
 7x - 5x & = & 3 \\
 2x & = & 3 \\
 x & = & \frac{3}{2} \\
 x & = & 1.5
 \end{array}$$

$$\begin{array}{rcl}
 \text{total strength} & = & 7x + 5x \\
 & = & 12x \\
 & = & 12 \times 1.5 \\
 & = & 18
 \end{array}$$

16-5-20

Q 11 Baichung's father is 26 years younger than Baichung's grandfather is 26 years younger than older than Baichung. The sum of the ages of all the 3 is 135 years. What is the age of each one of them?

Ans B, B's father, B's grandfather
 x $x+29$ $x+26$
 $x-29$ x $x+26$

Baichung's father age will be = x
 Baichung's age = $x-29$
 Baichung's grandfather = $x+26$

$$x + (x - 29) + (x + 26) = 135$$

$$x + x - 29 + x + 26 = 135$$

$$3x - 3 = 135$$

$$3x = 135 + 3$$

$$3x = 138$$

$$x = \frac{138}{3}$$

$$x = 46$$

Father = 46
 Baichung's age = $x - 29$
 $= 46 - 29 = 17$

Grandfather's age = $x + 26$
 $= 46 + 26 = 72$

Q:12 15 years from now Ravi's age will be four times his present age. What is Ravi's present age?

Ans Let Ravi's present age be x .
 After 15 years = $4x$

ATA

$$x + 15 = 4x$$

$$15 = 4x - x$$

$$15 = 3x$$

$$x = \frac{15}{3}$$

$$x = 5$$

Q:13 A rational number is such that when you multiply it by $\frac{5}{2}$ and add $\frac{2}{3}$ to the product, you get $\frac{-7}{12}$. What is the number?

Let the number be x

$$\frac{5}{2}x + \frac{2}{3} = -\frac{7}{12}$$

$$\frac{5x}{2} = -\frac{7}{12} - \frac{2}{3}$$

$$\frac{5x}{2} = \frac{-7-8}{12}$$

$$\frac{5x}{2} = \frac{-15}{12}$$

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

$$\frac{5}{4}x = \frac{-5}{12} \times \frac{4}{5}$$

$$x = \frac{-1}{3}$$

Q 14 Lakshmi is a cashier in a bank. She has currency notes of ~~₹~~ denomination ₹ 100, ₹ 50 and ₹ 10 respectively. The ratio ~~of~~ of the number of these notes is 2:3:5. The total cash with Lakshmi is ₹ 4,00,000. How many notes of each denomination does she have?

A

2:3:5

2x 3x 5x

Let the no of notes be = 2x, 3x, 5x

$$2x + 3x + 5x =$$

₹100

$$100(2x) + 50(3x) + 10(5x) = 4,00,000$$

$$200x + 150x + 50x = 4,00,000$$

$$400x = 4,00,000$$

$$x = \frac{4,00,000}{400}$$

$$x = 1,000$$

$$100 \Rightarrow 2x = 2 \times 1,000 = 2,000$$

$$50 \Rightarrow 3x = 3 \times 1,000 = 3,000$$

$$10 \Rightarrow 5x = 5 \times 1,000 = 5,000$$

Q 15

I have a total of ₹ 300 in coins of denomination ₹ 1, ₹ 2, and ₹ 5. The no of ₹ 2 coins is 3 times the no of ₹ 5 coins. The total no of coins is ₹ 160. How many coins of each denomination are with me?

₹ 1, ₹ 2, ₹ 5

Let no of ₹ 5 coins be x

$$₹ 2 = 3x$$

$$₹ 1 = 160 - 3x - x$$

$$= 160 - 4x$$

ATQ

$$(160 - 4x) + 2(3x) + 5(x) = 300$$

$$160 - 4x + 6x + 5x = 300$$

$$160 - 4x + 11x = 300$$

$$160 + 7x = 300$$

$$7x = 300 - 160$$

$$7x = 140$$

$$x = \frac{140}{7}$$

7

₹ 2

$$= 3 \times 200$$

$$= 600$$

$$₹ 1 = 160 - 4x$$

$$= 160 - 4(20)$$

$$= 160 - 80$$

$$= 80$$

Q 16 The organizers of an essay competition decide that a winner in the competition gets a prize of ₹ 100 and a participant who did not win gets a prize of ₹ 25. The total prize money distributed is ₹ 3,000. Find the no of winners, if the total no of participants is 63.

Ans Let be winners be = x
 Participants who did not win = 63 - x

$$100(x) + 25(63 - x) = 3000$$

$$100x + 1575 - 25x = 3000$$

$$75 + 1575 = 3000$$

$$75x = 3000 - 1575$$

$$75x = 1425$$

$$x = \frac{1425}{75} = 19$$

$$x = 19$$

Q1

10/5/20

$$Ex = 2 \times 3$$

Q1 Or Solve the following and check results.

(1) $3x = 2x + 18$

(2) $5t - 3 = 3t - 5$

Ans $3x - 2x = 18$
 $x = 18$

Ans $5t - 3t = -5 + 3$

$$2t = -2$$

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

$$t = -1$$

Checking

$$3x = 2x + 18$$

$$3 \times 18 = 2 \times 18 + 18$$

$$54 = 36 + 18$$

$$54 = 54$$

$$LHS = RHS$$

$$t = -1$$

Checking

$$5t - 3 = 3t - 5$$

$$5(-1) - 3 = 3(-1) - 5$$

$$-5 - 3 = -3 - 5$$

$$-8 = -8$$

$$LHS = RHS$$

(iii) $5x + 9 = 5 + 3x$

$$5x - 3x = 5 - 9$$

$$2x = -4$$

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

$$x = -2$$

Checking

$$5x + 9 = 5 + 3x$$

$$5(-2) + 9 = 5 + 3(-2)$$

$$-10 + 9 = 5 - 6$$

$$-1 = -1$$

$$LHS = RHS$$

(iv) $4z + 9 = 6 + 2z$

$$4z - 2z = 6 - 9$$

$$2z = -3$$

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

$$4z + 9 = 6 + 2z$$

$$4\left(\frac{-3}{2}\right) + 9 = 6 + 2\left(\frac{-3}{2}\right)$$

$$6 + 3 = 6 + 3$$

$$9 = 9$$

$$LHS = RHS$$

classmate
Date _____
Page 34

$$(v) 2x - 1 = 14 - x$$

$$\text{A} \quad 2x + x = 14 + 1$$

$$3x = 15$$

$$x = \frac{15}{3}$$

$$\boxed{x = 5}$$

Checking

$$2(5) - 1 = 14 - 5$$

$$10 - 1 = 9$$

$$9 = 9$$

$$9 = 9$$

LHS

LHS = RHS

$$(vi) 8x + 4 = 3(x - 1) + 7$$

$$\text{A} \quad 8x + 4 = 3x - 3 + 7$$

$$8x - 3x = 4 - 4$$

$$5x = 0$$

$$x = \frac{0}{5}$$

$$\boxed{x = 0}$$

Check

$$8x + 4 = 3(x - 1) + 7$$

$$8(0) + 4 = 3(0 - 1) + 7$$

$$0 + 4 = 0 - 3 + 7$$

$$4 = 4$$

LHS = RHS

classmate
Date _____
Page 35

$$(vii) x = \frac{4}{5}(x + 10)$$

$$\text{A} \quad 5x = 4(x + 10)$$

$$5x = 4x + 40$$

$$5x - 4x = 40$$

$$x = 40$$

Check

$$x = \frac{4}{5}(x + 10)$$

$$40 = \frac{4}{5}(40 + 10)$$

$$40 = \frac{4}{5} \times (50)$$

$$40 = 4 \times 10$$

$$40 = 40$$

LHS = RHS

$$(viii) \frac{2x}{3} + 1 = \frac{7x}{15} + 3$$

$$\frac{2x}{3} - \frac{7x}{15} = 3 - 1$$

$$\frac{10x - 7x}{15} = 2$$

$$\frac{3x}{15} = 2$$

$$x = 2 \times \frac{5}{3}$$

$$x = 2 \times 5$$

$$\boxed{x = 10}$$

$$\frac{2x}{3} + 1 = \frac{7x}{15} + 3$$

$$\frac{2 \times 10}{3} + 1 = \frac{7 \times 10}{15} + 3$$

$$\frac{20}{3} + 1 = \frac{14}{3} + 3$$

$$\frac{20+3}{3} = \frac{14+9}{3}$$

$$\frac{23}{3} = \frac{23}{3}$$

$$\text{LHS} = \text{RHS}$$

$$(ix) \quad 2y + \frac{5}{3} = \frac{26}{3} - y$$

$$\text{Ans} \quad 2y + y = \frac{26}{3} - \frac{5}{3}$$

$$3y = \frac{26-5}{3}$$

$$3y = \frac{21}{3}$$

$$3y = 7$$

$$\boxed{y = \frac{7}{3}}$$

Check

$$2y + \frac{5}{3} = \frac{26}{3} - y$$

$$2\left(\frac{7}{3}\right) + \frac{5}{3} = \frac{26}{3} - \left(\frac{7}{3}\right)$$

$$\frac{14}{3} + \frac{5}{3} = \frac{26}{3} - \frac{7}{3}$$

$$\frac{14+5}{3} = \frac{26-7}{3}$$

$$\frac{19}{3} = \frac{19}{3}$$

$$\text{LHS} = \text{RHS}$$

$$(x) \quad 3m = 5m - \frac{8}{5}$$

$$3m - 5m = -\frac{8}{5}$$

$$-2m = -\frac{8}{5}$$

$$m = \frac{8}{5 \times 2}$$

$$m = \frac{4}{5}$$

$$\boxed{m = \frac{4}{5}}$$

Check

$$3m = 5m - \frac{8}{5}$$

$$3\left(\frac{4}{5}\right) = 5\left(\frac{4}{5}\right) - \frac{8}{5}$$

$$\frac{12}{5} = 4 - \frac{8}{5}$$

$$\frac{12}{5} = \frac{4}{1} - \frac{8}{5}$$

$$\frac{12}{5} = \frac{20-8}{5}$$

$$\frac{12}{5} = \frac{12}{5}$$

LHS = RHS

9/6/20

Ex-2-4

Q:1 Amina thinks of a number and subtracts $\frac{5}{2}$ from it. She multiplies the result by 8. The result now obtained is 5 times the same no. She thought of what is the number.

A: Let the number = x

ATQ

$$8\left(x - \frac{5}{2}\right) = 5x$$

$$8x - 8 \times \frac{5}{2} = 5x$$

$$8x - 3 \times 20 = 5x$$

$$8x - 3x = 20$$

$$5x = 20$$

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

$$x = 4$$

Q:2 A positive number is 5 times another number. If 21 is added to both the then no then one of the new numbers becomes twice another number the other new number. What are the numbers?

Ans Let another no = x
Then the positive = $5x$

∴TA

$$\begin{aligned} 5x + 21 &= 2(x + 21) \\ 5x + 21 &= 2x + 42 \\ 5x - 2x &= 42 - 21 \\ 3x &= 21 \\ x &= \frac{21}{3} \end{aligned}$$

$$\boxed{x = 7}$$

$$\begin{aligned} \text{positive no} &= 5x \\ &= 5 \times 7 = 35 \end{aligned}$$

Q:3 Sum of digits of a digit number is 9. When we interchange the digits, it is found that the resulting new no is greater than the original no by 27. What is the two-digit number?

Ans Let the unit place digit = x
Let the unit place digit = y

$$\begin{aligned} x + y &= 9 \\ x &= 9 - y \end{aligned}$$

$$\text{original no} = 10y$$

$$\text{New no} = 10x + y$$

∴TA

$$\text{New no} = \text{original} + 27$$

$$10x + y = 10y + x + 27$$

$$10x - x + y - 10y = 27$$

$$9x - 9y = 27$$

$$9(9 - y) - 9y = 27$$

$$81 - 9y - 9y = 27$$

$$-18y = 27 - 81$$

$$-18y = -54$$

$$y = \frac{-54}{-18}$$

$$\boxed{y = 3}$$

$$x + y = 9$$

$$x + 3 = 9$$

$$x = 9 - 3 = 6$$

$$\boxed{x = 6}$$

$$\begin{aligned} \text{original no} &= 10y + x \\ &= 10 \times 3 + 6 \\ &= 36 \end{aligned}$$

Q 4 One of the 2 digits of a two digit number is 3 times of this other digits of this two digit no and

Q 4 One of two digits of a two digits of a two digit no is three times the other digit. If you interchange the digits of this two digit number and add the resultant no to the original no, you get 88, what is the original no.

Ans Let the unit place digit = x
and tens place digit = y

Case - I
Unit digit = $3 \times$ tens place digit | tens place digit = $3 \times$ unit place digit

$$x = 3y \quad \text{or} \quad y = 3x$$

$$\begin{aligned} \text{original no} &= 10y + x \\ \text{New no} &= 10x + y \\ \text{original no} + \text{new no} &= 88 \\ 10y + x + 10x + y &= 88 \\ \begin{array}{r} 11y \\ 11x \end{array} + \begin{array}{r} 11x \\ 11y \end{array} &= 88 \end{aligned}$$

$$y + x = 8$$

Case \rightarrow I

$$y + 3y = 8$$

$$4y = 8$$

$$y = \frac{8}{4}$$

$$\boxed{y = 2}$$

$$x = 3y = 3 \times 2$$

$$\boxed{x = 6}$$

==

$$\begin{aligned} \text{original no} &= 10y + x \\ &= 10 \times 2 + 6 \end{aligned}$$

$$\boxed{\text{original no} = 26}$$

Case 2

$$y = 3x$$

$$y + x = 8$$

$$3x + x = 8$$

$$4x = 8$$

$$\boxed{x = 2}$$

$$y = 3x = 3 \times 2$$

$$\boxed{y = 6} \rightarrow$$

$$\begin{aligned} \text{original no} &= 10y + x \\ &= 10 \times 6 + 2 \end{aligned}$$

$$\boxed{\text{original no} = 62}$$

Q: 5 Shobo's mother's present age is six times Shobo's present age. Shobo's age five years from now will be one-third of his mother's present age. What are their present ages?

Ans Let Shobo's present age = x years
and Shobo's mother's present = $6x$ years

Shobo's age after 5 years = $x + 5$ years

ATA

Shobo's age after 5 years = $\frac{1}{3}$ (mother's present age)

$$x + 5 = \frac{1}{3}(6x)$$

$$3(x + 5) = 6x$$

$$3x + 15 = 6x$$

$$15 = 6x - 3x$$

$$15 = 3x$$

$$\frac{15}{3} = x$$

$$5 = x$$

$$\boxed{5 = x}$$

Shobo's present age = 5 years

mother's " " = $6x$

$$= 6 \times 5$$

$$= 30 \text{ year}$$

Q: 6 There is a narrow rectangular plot, reserved for a school, the length and breadth of the plot are in 11:4 at the rate of ₹100 per metre it will cost the village panchayat ₹75,000 to fence. What is the dimension of the plot.

Ans Length : breadth = 11:4

Let length = $11x$

and breadth = $4x$

total cost = rate \times perimeter

$$75000 = 100 \times 2(2l + b)$$

$$75000 = 2(11x + 4x)$$

$$8$$

$$750 = 2(15x)$$

$$750 = 30x$$

$$\frac{750}{30}$$

$$25 = x$$

$$25$$

$$\boxed{25 = x}$$

$$\text{length} = 11x = 11 \times 25$$

$$\text{length} = 275 \text{ m}$$

$$\text{breadth} = 4x$$

$$= 4 \times 25$$

$$= 100$$

Q 7 Haroon buys 2 kinds of cloth materials for school uniforms, shirt material that costs him Rs 70 per meter. For every 2 meters of ~~for every~~ material he buys 3x of shirt shirt material. He sells the material at 17% and 10% profit ~~res~~ respectively. His total sale is 36,600. How much ~~trouser~~ did he buy.

Ans Cost of 1 m shirt material = 50 ₹

Cost of 1 m Trousers material = 90 ₹

Let total shirt material = 3x

and total Trousers " = 2x

Total C.P of shirt = 3x × 50 = 150x ₹

" C.P of Trousers = 2x × 90 = 180x ₹

Total S.P of shirt material = T.C.P + P
 = 150x + 17% of 150x
 = 150x + $\frac{17}{100}$ of 150x
 = 150x + 18x = 168x

Total S.P of shirt = 150x + 18x = 168x

Total S.P of shirt
 Trousers = 150x + 18x =
 = T.C.P + P
 = 180x + 10% of 180x

$$= 180x + 10\% \text{ of } 180x$$

$$= 198x$$

$$\text{Total sale} = 36,600$$

$$168x + 198x = 36,600$$

$$366x = 36,600$$

$$x = \frac{36,600}{366} \times 100$$

$$x = 100$$

amount of trousers material = 2x
 = 2 × 100
 = 200 m

Q 8 Half of a herd of deer are grazing in the field and three fourth of remaining are playing nearby. The rest are drinking water from the pond. Find the no. of deer in herd.

Ans Let total no of deer in herd = x

No of deer grazing = $\frac{x}{2}$

No of deer playing = $\frac{3}{4}(x - \frac{x}{2})$

" " " drinking water = 9

$$\text{total dex} = \frac{x}{2} + \frac{3}{4} \left(\frac{x-x}{2} \right) + 9$$

$$x = \frac{x}{2} + \frac{3}{4} \left(\frac{x}{2} \right) + 9$$

$$x = \frac{x}{2} + \frac{3x}{8} + 9$$

$$\frac{x}{1} - \frac{x}{2} - \frac{3x}{8} = 9$$

$$\frac{8x - 4x - 3x}{8} = 9$$

$$8x - 7x = 9 \times 8$$

$$\boxed{x = 72}$$

Q: 9 A grandfather is ten times older than his granddaughter. He is also 54 years older than her. Find their present ages.

Ans Let present age of granddaughter = x years
So " " grandfather = $10x$ years

ATQ
grandfather's present age = 54 more than granddaughter's age

$$10x = 54 + x$$

$$10x - x = 54$$

$$9x = 54$$

$$x = \frac{54}{9} \Rightarrow \boxed{x = 6}$$

granddaughter = 6 year

grandfather = $10x$
= $10 \times 6 = 60$ year

Q: 10 A man's age is three times his son's age. Ten years ago he was 5 times his son's age. Find their present ages.

Ans Let present age of son = x yrs

So present age of man = $3x$ yrs
10 years ago

age of son was = $x - 10$ yrs
man

Age of ~~son~~ was = $3x - 10$ yrs

ATQ

$$(3x - 10) = 5(x - 10)$$

$$3x - 10 = 5x - 50$$

$$3x - 5x = -50 + 10$$

$$-2x = -40$$

$$x = \frac{40}{2}$$

$$\boxed{x = 20}$$

Son's age = $\frac{x}{1} = 20$ years

Man's age = $3x = 3 \times 20 = 60$ yrs

11/6/20

Ex-2.5

Q.1 solve the following linear equations:-

$$(i) \frac{x}{2} - \frac{1}{5} = \frac{x}{3} + \frac{1}{4}$$

$$= \frac{x}{2} - \frac{x}{3} = \frac{1}{4} + \frac{1}{5}$$

$$\frac{3x-2x}{6} = \frac{5+4}{20}$$

$$\frac{x}{6} = \frac{9}{20}$$

$$20x = 54$$

$$x = \frac{54 \times 27}{20 \times 10}$$

$$x = \frac{27}{10}$$

$$(ii) \frac{2m}{2} - \frac{3m}{4} + \frac{5m}{6} = 21$$

$$\frac{6m-9m+10m}{12} = 21$$

$$\frac{16m-9m}{12} = 21$$

$$7m = 21 \times 12$$

$$m = \frac{21 \times 12}{7}$$

$$m = 3 \times 12 = 36$$

$$(ii) x + 7 - \frac{8x}{3} = \frac{17}{6} - \frac{5x}{2}$$

$$\text{Ans } \frac{x}{1} - \frac{8x}{3} + \frac{5x}{2} = \frac{17}{6} - 7$$

$$\frac{2x-16x+15x}{6} = \frac{17-42}{6}$$

$$2x-16x = -25$$

$$5x = -25$$

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

$$x = -5$$

$$(iv) \frac{x-5}{3} = \frac{x-3}{5}$$

$$5(x-5) = 3(x-3)$$

$$5x-25 = 3x-9$$

$$5x-3x = -9+25$$

$$2x = 16$$

$$x = \frac{16}{2}$$

$$(v) \frac{3t-2}{4} - \frac{2t+3}{3} = \frac{2}{3} - t$$

$$\frac{3t-2}{4} - \frac{2t+3}{3} + t = \frac{2}{3}$$

$$\frac{3(3t-2) - 4(2t+3) + 12t}{12} = \frac{2 \times 4}{3}$$

$$\frac{9t-6-8t-12+12t}{12} = \frac{8}{3}$$

$$13t-18 = \frac{2}{3} \times 12$$

$$13t-18 = 8$$

$$13t = 8+18$$

$$13t = 26$$

$$t = \frac{26}{13}$$

$$\boxed{t = 2}$$

$$(vi) m - \frac{(m-1)}{2} = 1 - \frac{(m-2)}{3}$$

$$m - \frac{(m-1)}{2} + \frac{(m-2)}{3} = 1$$

$$\frac{6m-3(m-1)+2(m-2)}{6} = 1$$

$$+6m-3m+3+2m-4 = 1 \times 6$$

$$5m-1 = 6$$

$$5m = 6+1$$

$$5m = 7$$

$$m = \frac{7}{5}$$

$$(vii) 3(t-3) = 5(2t+1)$$

$$3t-9 = 10t+5$$

$$3t-10t = 5+9$$

$$-7t = 14$$

$$t = \frac{14}{-7}$$

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

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

(viii) $15(y-4) - 2(y-9) + 5(y+6) = 0$

$$15y - 60 - 2y + 18 + 5y + 30 = 0$$

$$20y - 2y + 48 - 60 = 0$$

$$18y - 12 = 0$$

$$18y = 12$$

$$y = \frac{12}{18}$$

$$y = \frac{2}{3}$$

(ix) $3(5z-7) - 2(9z-11) = 4(8z-13) - 17$

$$15z - 21 - 18z + 22 = 32z - 52 - 17$$

$$-3z + 1 = 32z - 69$$

$$1 + 69 = 32z + 3z$$

$$70 = 35z$$

$$\frac{70}{35} = z$$

$$z = 2$$

(x) $0.25(4f-3) = 0.05(10f-9)$

$$1.00f - 0.75 = 0.50f - 0.45$$

$$1.00f - 0.50f = -0.45 + 0.75$$

$$0.50f = +0.30$$

$$f = \frac{0.30}{0.50}$$

$$f = \frac{30}{50}$$

$$f = \frac{3}{5}$$

$$f = 6$$

11/6/20

Ex-2.6

Q.1 Solve the following equations

(i) $\frac{8x-3}{3x} = 2$ (ii) $\frac{9x}{7-6x} = 15$

$$= 8x - 3 = 2 \times 3x$$

$$= 8x - 3 = 6x$$

$$= 8x - 6x = 3$$

$$= 2x = 3$$

$$= \boxed{x = \frac{3}{2}}$$

$$= 9x = 15(7-6x)$$

$$= 9x = 105 - 90x$$

$$= 9x + 90x = 105$$

$$= 99x = 105$$

$$= x = \frac{105}{99} = \frac{35}{33}$$

$$\boxed{x = \frac{35}{33}}$$

(iii) $\frac{z}{z+15} = \frac{4}{9}$

$$9z = 4(z+15)$$

$$9z = 4z + 60$$

$$9z - 4z = 60$$

$$5z = 60$$

$$z = \frac{60}{5} = 12$$

(iv) $\frac{3y+4}{2-6y} = \frac{-2}{5}$

$$5(3y+4) = -2(2-6y)$$

$$15y + 20 = -4 + 12y$$

$$15y - 12y = -4 - 20$$

$$3y = -24$$

$$y = \frac{-24}{3} = -8$$

$$3y = -24$$

$$y = \frac{-24}{3} = -8$$

$$\boxed{y = -8}$$

(v) $\frac{7y+4}{y+2} = \frac{-4}{3}$

$$3(7y+4) = -4(y+2)$$

$$21y + 12 = -4y - 8$$

$$21y + 4y = -8 - 12$$

$$25y = -20$$

$$y = \frac{-20}{25} = -\frac{4}{5}$$

$$\boxed{y = -\frac{4}{5}}$$

Q.6 The age of Hari and Harry are in the ratio 5:7. Four years from now the ratio of their ages will be 3:4. Find their present ages.

Ans

Q. 6. The
 Let present age of Hari = $5x$ yrs
 and present age of Harry = $7x$ yrs

4 years later

Age of Hari will be = $5x + 4$ yrs
 Age of Harry will be = $7x + 4$ yrs

∴ TA

$$\frac{5x+4}{7x+4} = \frac{3}{4}$$

$$4(5x+4) = 3(7x+4)$$

$$20x + 16 = 21x + 12$$

$$16 - 12 = 21x - 20x$$

$$4 = x$$

present age of Hari = $5x = 5 \times 4 = 20$ yrs

" " " Harry = $7x = 7 \times 4 = 28$ yrs

Q. 7. The Denominator of a rational no. is greater than its Numerator by 8. If the numerator is increased by 17 and the denominator is decreased by 1 the no. obtained is $\frac{3}{2}$. Find the no.

Ans. Let the numerator = x
 then the Denominator = $x + 8$

No. = $\frac{\text{numerator}}{\text{Denominator}}$

$$\text{number} = \frac{x}{x+8}$$

∴ TA

$$\frac{\text{numerator} + 17}{\text{denominator} - 1} = \frac{3}{2}$$

$$\frac{x+17}{x+8-1} = \frac{3}{2}$$

$$\frac{x+17}{x+7} = \frac{3}{2}$$

$$2(x+17) = 3(x+7)$$

$$2x + 34 = 3x + 21$$

$$34 - 21 = 3x - 2x$$

$$13 = x$$

$$\text{No} = \frac{x}{x+8}$$

$$= \frac{13}{13+8}$$

=

$$\boxed{\text{No} = \frac{13}{21}}$$