7th Linear Equation of one variable Test Paper

1. The sum of two numbers is 43. If the larger is doubled and the smaller is tripled, the difference is 36. Find the numbers.

2. The sum of the digits of a two digit number is 12. If the digits are reversed, the new number is 12 less than double the original number. Find the number

3. A number of two digits exceed four times the sum of its digits by 6 and it is increased by 9 on reversing its digits. Find the number.

4. There are 38 coins in a collection of 20 paise coins and 25 paise coins. If the total vaL e of the collection is Rs 8.50, find the number of 25 paise coins.

5. The sum of ages of A and B is 40 years. Five years ago, twice the age of A added to three times of age of B was 70 years. Find their present ages.

6. Four years ago, Sumitra was three times as old as her daughter. Six years from now the mother will be twice as old as her daughter. Find their present ages.

7. Solve x -3y = 3x -1 = 2x -y.

8. Six years hence a man's age will be three times his sons age and three years ago he was nine times as old as his son. Find their present ages.[30 years, 6 years]

9. Rani has currency notes of denominations Rs. 100. Rs 50 and Rs. 10 . The ratio of the number of these notes is 2:3:5 respectively. The total cash with Rani is Rs. 4. 00.000. How many notes of each denomination does she have?

10. $(a)\frac{2}{3}(x-5)-\frac{1}{4}(x-2)=\frac{9}{2}$ $(b)\frac{3}{4}(7x-1)-\left[2x-\frac{1-x}{2}\right]=x+\frac{3}{2}$

11. Divide 150 into three parts, such that the second number is five-sixths the first and the third number is four-fifths the second.

12. In an isosceles triangle the base angles are equal and the vertex angle is twice the each base angle. Find the measure of each angles?

13. The ages of Rahul and Haroon are in the ratio of 5:7. Four years from now sum of their ages will be 56 years. Find their present age

14. Hari and Harry's age are in the ratio of 5:7. Four years later the ratio of their ages will be 3:4. Find their current age.

15. Divide 184 into two parts such that one third of first part may exceed one seventh of the other part by 8.

16. A laborers is engaged for 20 days on the condition that he will receive Rs 120 for each day he day he works and will be fined Rs. 10 for each day he is absent If he receives Rs. 1880 in all .For how many days did remain absent?

17. How much pure alcohol must be added to 400 ml of a 15% solution to make its strength 32%

18. Two equal sides of triangle are each 5 m less than twice the third side. If the perimeter of triangle is 55m Find length of each side

19. Five years ago a man was seven times as old as his son. Five years hence the father will be three times as old as his son. Find their ages?

20. Two supplementary angle differ by 10 find larger angle?

(1) Let one no. be x (larger no.)
$\Rightarrow$ other no will be $(43-x)$

A/Q $\rightarrow$ $2x - 3(43-x) = 36$

$2x - 129 + 3x = 36$

$5x = 36 + 129$

$x = 165/5 = 33$

$\therefore$ larger no $= 33$
other no $= 43 - 33 = 10$

(2) Let the two digit nos $\rightarrow 10x + y$

A/Q $\rightarrow$ $x + y = 12 \Rightarrow \boxed{x = 12 - y}$

A/Q $\rightarrow$ $(10y + x) = 2(10x + y) - 12$

$\Rightarrow 10y + x = 20x + 2y - 12$

$\Rightarrow 10y - 2y = 20x - x - 12$

$\Rightarrow 8y = 19x - 12$

Put $\boxed{x = 12 - y}$

$\Rightarrow 8y = 19(12-y) - 12$

$\Rightarrow 8y = 228 - 19y - 12$

$\Rightarrow 8y + 19y = 228 - 12$

$\Rightarrow 27y = 216 \Rightarrow y = 216/27 = 8$

$\therefore y = 8 \Rightarrow x = 12 - y = 12 - 8 = 4$

$\Rightarrow$ Required no $= 48$

(3.) Let the two digit number $= 10x+y$

A/Q → $10x+y = 4(x+y)+6$

$\Rightarrow 10x+y = 4x+4y+6$

$\Rightarrow 10x-4x = 4y-y+6$

$\Rightarrow [6x]\div 3 = 3y+6]\div 3$

$\Rightarrow 2x = y+2 \Rightarrow \boxed{2x-2=y}$

A/Q → $(10x+y)+9 = (10y+x)$

$\Rightarrow 10x-x+9 = 10y-y$

$\Rightarrow [9x+9]\div 9 = (9y)\div 9$

$\Rightarrow \boxed{x+1 = y}$

$x+1 = 2x-2$ (from ①)

$\Rightarrow 1+2 = 2x-x$

$\Rightarrow \boxed{3=x} \Rightarrow y = 2x-2 = 2\times 3-2$

$\Rightarrow \boxed{y=4}$

$\boxed{\therefore \text{Required no} = 34}$

4. Total Coins $= 38$, Let 20 paise Coin $= x$

$\Rightarrow$ 25 paise coins $= (38-x)$

A/Q $(0.20\times x) + 0.25\times(38-x) = 8.50$

$\Rightarrow 0.20x + 9.50 - 0.25x = 8.50$

$\Rightarrow -0.05x = 8.50-9.50 = -1$

$\Rightarrow x = \frac{1}{0.05} = \frac{100}{5} = 20.$

$\therefore$ 20 paise Coin $= 20$, 25 paise Coins $= 38-20 = 18$

(5) Let A's age $= x$, B's age $= (40-x)$

5 yrs ago $\Rightarrow$ $2(x-5) + 3(40-x-5) = 70$

$\Rightarrow 2(x-5) + 3(35-x) = 70$

$\Rightarrow 2x - 10 + 105 - 3x = 70$

$\Rightarrow -x + 95 = 70$

$\Rightarrow 95 - 70 = x$

$\Rightarrow 25 = x$

A's age $= 25$ yrs, B's age $= 40 - 25 = 15$ yrs.

6. Let 4 yrs ago, Daughter's age $= x$

Sumitra age $= 3x$

$\Rightarrow$ Present age $\rightarrow$ Daughter $= (x+4)$ yrs

$\rightarrow$ Sumitra $= (3x+4)$ yrs.

A/q $\rightarrow$ After 6 yrs $\Rightarrow$ Sumitra age $= 2 \times$ Daughter age

$\Rightarrow (3x+4)+6 = \{(x+4)+6\} \times 2$

$\Rightarrow 3x + 10 = 2x + 20$

$\Rightarrow 3x - 2x = 20 - 10$

$\Rightarrow x = 10$

$\therefore$ Daughter present age $= x+4$

$= 10+4 = 14$ yrs

Sumitra's age $= 3x+4 = 3 \times 10 + 4$

$= 34$ yrs.

(7) $x-3y = 3x-1 = 2x-y$

$x-3y = 3x-1$ | $3x-1 = 2x-y$

$\Rightarrow -3y+1 = 3x-x$ | $3x-2x = -y+1$

$\Rightarrow -3y+1 = 2x$ | $x = 1-y$

Put $x = 1-y$

$\Rightarrow -3y+1 = 2(1-y) \Rightarrow -3y+1 = 2-2y$

$\Rightarrow -3y+2y = 2-1$

$\Rightarrow -y = 1 \Rightarrow \boxed{y = 1}$

So, $x = 1-y = 1-1 = 0$

$\therefore \boxed{x = 0}$

8. Let after 6 yrs, Son's age $= x$

Man's age $= 3x$

Present age → Son → $(x-6)$ yrs

→ Man's age $= (3x-6)$ yrs

3 yrs ago →

Man's age $= 9 \times$ Son's age

$[(3x-6)-3] = 9[(x-6)-3]$

$\Rightarrow 3x-9 = 9(x-9)$

$\Rightarrow 3x-9 = 9x-81$

$\Rightarrow -9+81 = 9x-3x$

$\Rightarrow 72 = 6x$

$\Rightarrow x = 12$

Son's age $= x-6 = 12-6 = 6$ yr

Man's age $= 3x-6 = 3\times12-6 = 30$ yr.

9. Let Rs 100 notes = $2x$
Rs 50 notes = $3x$
Rs 10 notes = $5x$

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

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

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

$\Rightarrow x = 4,00,000 \div 400$

$\Rightarrow x = 1000$

So, Rs 100 notes $= 2 \times 1000$
$= 2000$ notes

Rs 50 notes $= 3 \times 1000 = 3000$ notes
Rs 10 notes $= 5 \times 1000 = 5000$ notes

10(i) $\frac{2}{3}(x-5) - \frac{1}{4}(x-2) = \frac{9}{2}$

$\Rightarrow \frac{8(x-5) - 3(x-2)}{12} = \frac{9}{2}$

$\Rightarrow 8x - 40 - 3x + 6 = \frac{9}{2} \times 6$

$\Rightarrow 5x - 34 = 54$

$\Rightarrow 5x = 54 + 34 = 88$

$\Rightarrow x = \frac{88}{5} = 17.6$

(ii) $x + \frac{3}{2} = \frac{3}{4}(7x-1) - \left\{2x - \frac{1-x}{2}\right\}$

$\frac{2x+3}{2} = \frac{3}{4}(7x-1) - \left\{\frac{4x-(1-x)}{2}\right\}$

$\frac{2x+3}{2} = \frac{3}{4}(7x-1) - \left\{\frac{4x-1+x}{2}\right\}$

$\Rightarrow \frac{3}{4}(7x-1) - \frac{(5x-1)}{2}$

$\Rightarrow \frac{3(7x-1) - 2(5x-1)}{4}$

$\Rightarrow \frac{21x - 3 - 10x + 2}{4}$

$= \frac{11x-1}{4} = \frac{2x+3}{2}$

$\Rightarrow 22x - 2 = 8x + 12$

$\Rightarrow 22x - 8x = 12 + 2$

$\Rightarrow 14x = 14 \Rightarrow x = 1$

4.

11. Let first part $= x$

2nd part $= \frac{5}{6}$th of first

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

3rd part $= \frac{4}{5}$ of 2nd part

$= \frac{\cancel{4}^{2} \times \cancel{5}}{\cancel{6}_{3}} x$

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

NOW: $\rightarrow \quad x + \frac{5}{6}x + \frac{2}{3}x = 150$

$\Rightarrow \quad \frac{6x + 5x + 4x}{6} = 150$

$\Rightarrow \quad \frac{15}{6}x = 150$

$\Rightarrow \quad x = \frac{\overset{10}{\cancel{150}} \times 6}{\cancel{15}} = 60$

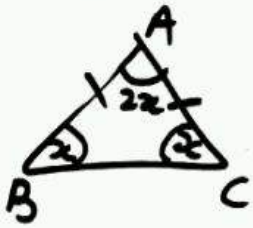
$\therefore$ First part $= \underline{60}$

2nd part $= \frac{5}{6} \times 60 = \underline{50}$

3rd part $= \frac{2}{3} \times \overset{20}{\cancel{60}} = \underline{40}$

12. In $\triangle ABC$, $\angle B = \angle C = x$ let

$\Rightarrow \angle A = 2x$



$\rightarrow \angle A + \angle B + \angle C = 180^\circ$

$2x + x + x = 180$

$x = 180/4 = 45$

$\therefore \angle A = 2 \times 45 = 90^\circ$

$\angle B = \angle C = 45^\circ$

13. Let Rahul's age $= 5x$

and Haroun's age $= 7x$

Four yrs from NOW

Sum of ages $= 56$

$(5x+4)+(7x+4)=56$

$\Rightarrow 12x + 8 = 56$

$\Rightarrow 12x = 56 - 8$

$\Rightarrow 12x = 48$

$x = 4$

$\therefore$ Rahul's age $= 5\times4 = 20$ yrs.

Haroun's age $= 7\times4 = 28$ yrs

14. Hari's age $= 5x$, Harry's age $= 7x$

4 yrs latter $\Rightarrow$ Hari age $= 5x+4$

Harry age $= 7x+4$

$\rightarrow \frac{5x+4}{7x+4} = \frac{3}{4} \Rightarrow 20x+16 = 21x+12$

$\Rightarrow 20x - 21x = 12 - 16 \Rightarrow -x = -4$

$\Rightarrow x = 4 \quad \therefore$ Hari age $= 5\times4 = 20$ yrs

Harry age $= 7\times4 = 28$ yrs.

15. Let First part = x, 2nd part = $(184-x)$

A/Q → $\frac{1}{3}$ th of 1st part = $\frac{1}{7}$ th 2nd part + 8

$\Rightarrow \frac{1}{3}x = \frac{1}{7}(184-x) + 8$

$\Rightarrow \frac{x}{3} - \frac{1}{7}(184-x) = 8$

$\Rightarrow \frac{7x - 3(184-x)}{21} = 8$

$\Rightarrow 7x - 552 + 3x = 8 \times 21$

$\Rightarrow 10x = 168 + 552$

$\Rightarrow 10x = 720$

$x = \frac{720}{10} = 72$

∴ First part = $x = 72$

2nd part = $184 - 72 = 112$

16 Let labour was absent for x days

working day = $(20-x)$

A/Q → $120(20-x) - (10 \times x) = 1880$

→ $2400 - 120x - 10x = 1880$

$\Rightarrow 2400 - 130x = 1880$

$\Rightarrow 2400 - 1880 = 130x$

$\Rightarrow 520 = 130x$

$x = \frac{520}{130} = 4$

So he was absent for 4 days

17. Solution = 400 ml,

Alcohol = $\frac{15}{100} \times 400 = 60$ ml.

Let x ml alcohol added to make it 32% $\Rightarrow$ Alcohol = $\underline{(60+x)}$

New Solution = $(400+x)$ ← 32%

$\Rightarrow 32\%(400+x) = (60+x)$

$\Rightarrow \frac{32^{8}}{100_{25}}(400+x) = (60+x)$

$\Rightarrow 8(400+x) = 25(60+x)$

$\Rightarrow 3200 + 8x = 1500 + 25x$

$\Rightarrow 3200 - 1500 = 25x - 8x$

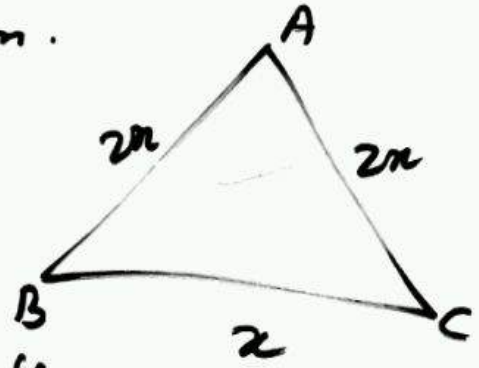
$\Rightarrow 1700 = 17x$

$\Rightarrow x = 1700/17 = \underline{100 \text{ ml.}}$

So, 100 ml alcohol added to make 32% concentration.

18. Third side = x

Two equal sides are = 2x



P = sum of all sides

$\Rightarrow 55 = x + 2x + 2x \Rightarrow x = \frac{55}{5} = 11$

$\therefore$ Two equal sides = $2 \times 11 = 22$ m

Third side = 11 m

19) Five year ago = Son's age = x
Man's age = $7x$

Present age = Son $x+5$
Man's age = $7x+5$

After five year = Son's age = $x+5+5$
$= x+10$
Man's age = $7x+5+5$
$= 7x+10$

A/Q = Man's age = 3 x son's age
$\Rightarrow 7x+10 = 3(x+10)$
$\Rightarrow 7x+10 = 3x+30$
$\Rightarrow 7x-3x = 30-10$
$\Rightarrow 4x = 20$
$\Rightarrow x = \frac{20}{4} = 5$

$\Rightarrow x = 5$
$\Rightarrow$ Son's age $= x+5 = 5+5 = 10$
$\Rightarrow$ Man's age $= 7x+5 =$
$= 7\times5+5$
$= 35+5$
$= 40$ yrs

20) 1st angle = x
2nd angle = $x+10$

$x+x+10 = 180°$
$\Rightarrow 2x = 180-10$
$\Rightarrow x = \frac{170}{2} = 85$

$\therefore$ 1st angle = $85°$ $\therefore$ 2nd angle = $85+10 = 95°$