

SECTION II

Question b:

(a)

Candidate A = 15000

Candidate B = 10000

Candidate C = 8000

Percentage = ?

Solution:

$$\% \text{ age of winning} = \frac{\text{Candidate A}}{\text{Total votes}} \times 100$$

$$= \frac{15000}{15000+10000+8000} \times 100$$

$$= \frac{15000}{33000} \times 100$$

$$= \frac{15}{33} \times 100$$

$$= 0.45 \times 100$$

$$= 45\%$$

$$\begin{array}{r} 2.2 \\ 15 \overline{) 33} \\ \underline{30} \\ 3 \end{array}$$

$$30$$

$$.45$$

$$\begin{array}{r} 1 \\ 33 \overline{) 330} \\ \underline{33} \\ 0 \end{array}$$

So the winner got 45% of the total votes.

$$\begin{array}{r} 180 \\ 165 \overline{) 330} \\ \underline{15} \\ 0 \end{array}$$

(B)

Ratio of angles = 3:4:5

each angle =

let θ be any angle such that

$3\theta : 4\theta : 5\theta$ is the ratio

Now we know that sum of all angles of a
triangle = 180 so

$$3\theta + 4\theta + 5\theta = 180^\circ$$

$$12\theta = 180^\circ$$

$$\theta = \frac{180}{12} = 15$$

$$\sqrt{180}$$

$$\theta = 15$$

so

$$\text{Angle 1} = 3\theta = 3(15) = 45^\circ$$

$$\text{Angle 2} = 4\theta = 4(15) = 60^\circ$$

$$\text{Angle 3} = 5\theta = 5(15) = 75^\circ$$

These are the three required angles.

(C)

Each group = 4 boys and 6 girls

Girls available = 102.

The ratio of boys to girls is 2:3

$$\text{So } 2:3::x:102$$

where x is the no. of boys required

$$\frac{2}{3} = \frac{x}{102} \quad \frac{2(102)}{3} = x$$

$$x = 2(34)$$

$$x = 68$$

So 68 boys will be required.

(D)

Presentages = 6:7

after 5 years = 7:8

find present.

Now

$$A:B = 6:7 \quad \text{--- (i)}$$

after 5 years

$$(A+5):(B+5) = 7:8 \quad \text{--- (ii)}$$

So

$$\frac{A}{B} = \frac{6}{7}$$

$$A = \frac{6}{7}(B) \quad \text{--- (iii)}$$

put in (ii)

$$A+5 = \frac{7}{8}(B+5)$$

$$A + 5 = \frac{7}{8}(B + 5)$$

$$\frac{6}{7}B + 5 = \frac{7B}{8} + \frac{35}{8}$$

$$\frac{6B}{7} - \frac{7B}{8} + 5 = \frac{35}{8}$$

$$\frac{48B - 49B}{56} = \frac{35 - 5}{8}$$

$$\frac{-B}{56} = \frac{35 - 40}{8}$$

$$\frac{+B}{56} = \frac{+5}{8}$$

$$\boxed{B = 35}$$

Now put in (iii)

$$A = \frac{6(35) + 5}{7}$$

$$\boxed{A = 30}$$

So the age of A is 30 and the age of B is 35

$$\begin{array}{r} 2 \overline{) 7.8} \\ 2 \overline{) 7.4} \\ 2 \overline{) 7.2} \\ 7 \overline{) 7.1} \end{array}$$

$$\begin{array}{r} 1 \\ 28 \\ 28 \\ \hline 56 \end{array}$$

QUESTION 8

(a)

Sum of three consecutive odd numbers is 273

so let x is an odd number

so $x+2$ is the next consecutive odd number

and $x+4$ is the 3rd consecutive odd number

so by condition

$$(x) + (x+2) + (x+4) = 273$$

$$3x + 6 = 273$$

$$3x = 273 - 6$$

$$x = \frac{267}{3} = 89$$

$$\boxed{x = 89}$$

so the three consecutive numbers are 89, 91 and 93

(b)

(i) 4, 16, 36, 64, —, 144

$$2^2 = 4$$

$$4^2 = 16$$

$$6^2 = 36$$

$$8^2 = 64$$

$$10^2 = 100$$

$$12^2 = 144$$

so the missing number is 100

$$(ii) \quad 30, 29, 27, \underline{24}, 20, 15$$

$$\quad \quad \quad \underbrace{\quad} \quad \underbrace{\quad} \quad \underbrace{\quad} \quad \underbrace{\quad}$$

$$\quad \quad \quad -1 \quad -2 \quad -3 \quad -4 \quad -5$$

$$\text{So } 27 - 3 = 24$$

$$\text{and } 24 - 4 = 20$$

So our condition is correct hence the missing number is 24

$$(iii) \quad 1, 7, 15, 25, \underline{37}, 51$$

$$\quad \quad \quad \underbrace{\quad} \quad \underbrace{\quad} \quad \underbrace{\quad} \quad \underbrace{\quad}$$

$$\quad \quad \quad +6 \quad +8 \quad +10 \quad +12 \quad +14$$

$$\text{So } 25 + 12 = 37$$

$$\text{and } 37 + 14 = 51$$

Hence 37 is the missing number.

$$(iv) \quad 0, 2, 6, 12, 20, \underline{30}, \underline{\quad}$$

$$\quad \quad \quad \underbrace{\quad} \quad \underbrace{\quad} \quad \underbrace{\quad} \quad \underbrace{\quad} \quad \underbrace{\quad}$$

$$\quad \quad \quad +2 \quad +4 \quad +6 \quad +8 \quad +10 \quad +12$$

So the missing number is 42.

$$(v) \quad 48, 24, 12, 35, 108, \underline{\quad}$$

$$\quad \quad \quad \underbrace{\quad}$$

$$\quad \quad \quad -24$$

Question wrong.

37

$$\begin{array}{r} 9 \\ 108 \\ \hline 72 \end{array}$$

$$\begin{array}{r} 108 \\ 22 \\ \hline 36 \end{array}$$

$$\div 2 \times 3$$

$$\begin{array}{r} 672 \\ 35 \\ \hline \end{array}$$

$$\begin{array}{r} -37 \\ 24 \\ \hline \end{array}$$

$$2413$$

11

$$\begin{array}{r} 672 \\ 48 \\ \hline \end{array}$$

$$\begin{array}{r} 24 \\ 72 \\ \hline \end{array}$$

$$96$$

$$\begin{array}{r} 96 \\ 660 \end{array}$$

put (i) and (ii) in (iii)

$$(x+3) + (6x+3) + (2x+3) = 72$$

$$x+3+6x+3+2x+3=72$$

$$9+9x=72$$

$$9x=72-9$$

$$9x=63$$

$$x = \frac{63}{9} = 7$$

$$\boxed{x=7}$$

so from (i) $y=6x \Rightarrow y=6(7)$

$$\boxed{y=42}$$

from (ii) $z=2x \Rightarrow z=2(7)$

$$\boxed{z=14}$$

So the age of Sara is 7
age of mother is 42
and age of Ali is 14.