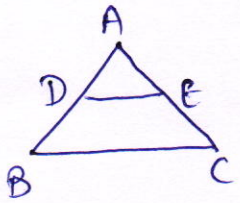
10th CBSE

10th July, '17

Maths test

Solution of PT-3M

Section: A

(1) 

In ΔABC we have,

$DE \parallel BC$

$\Rightarrow \frac{AD}{DB} = \frac{AE}{EC}$ (By Thale's theorem)

$\frac{AD}{DB} = \frac{5}{3} \Rightarrow \frac{AE}{EC} = \frac{5}{3}$.

$\Rightarrow \frac{EC}{AE} = \frac{3}{5}$

$\Rightarrow \frac{EC}{AE} + 1 = \frac{3}{5} + 1$ ∵| Add 1 on both the sides.

$\Rightarrow \frac{EC + AE}{AE} = \frac{3+5}{5}$

$\Rightarrow \frac{AC}{AE} = \frac{8}{5}$ ∵| $AC = AE + EC$

$\Rightarrow \boxed{\frac{AE}{AC} = \frac{5}{8}}$

(2) $\Delta ABC \sim \Delta PQR$

i.e. $\angle A = \angle P$, $\angle B = \angle Q$ & $\angle C = \angle R$.

$\angle A = 70^\circ$, $\angle Q = \angle B = 30^\circ$

∴ for ΔABC we have,

$\angle A + \angle B + \angle C = 180^\circ$ ∵| Angle sum property for triangle

$70^\circ + 30^\circ + \angle C = 180^\circ$

$\therefore \angle C = 180^\circ - 100^\circ$

$\therefore \boxed{\angle C = 80^\circ}$

(3) Ogive or cumulative frequency polygon curve

(4) mode = 3median − 2mean

(5) 2, 4, 6, 7, 5, 6, 10, 6, 7, 2k+1, 9, 7, 13

In the given data 6 & 7 having same frequency.

But, mode = 7

i.e. If, $2k+1 = 7$ then and only then we have mode as 7.

$\therefore \quad 2k+1 = 7$

$2k = 7-1$

$2k = 6$

$\therefore \boxed{k = 3}$

(6) First ten prime numbers are:

2, 3, 5, 7, 11, 13, 17, 19, 23, 29

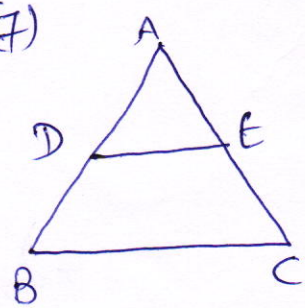
$$\text{mean} = \frac{2+3+5+7+11+13+17+19+23+29}{10}$$

$$= \frac{129}{10}$$

$$= 12.9$$

Section : B

(7)



In ΔABC,

$DE \parallel BC$

$\therefore$ By Thale's theorem,

$$\frac{AD}{DB} = \frac{AE}{EC}$$

$$\frac{4x-3}{3x-1} = \frac{8x-7}{5x-3}$$

$$\therefore (4x-3)(5x-3) = (8x-7)(3x-1)$$

$$\therefore 20x^2 - 12x - 15x + 9 = 24x^2 - 8x - 21x + 7$$

$$\therefore 20x^2 - 27x + 9 = 24x^2 - 29x + 7$$

$$\therefore 4x^2 - 2x - 2 = 0$$

$$\therefore 4x^2 - 4x + 2x - 2 = 0$$

$$\therefore 4x(x-1) + 2(x-1) = 0$$

$$\therefore (x-1)(4x+2) = 0$$

$$\therefore x - 1 = 0 \quad \text{or} \quad 4x + 2 = 0$$

$$\therefore x = 1 \quad \text{or} \quad x = -\frac{2}{4} = -1/2$$

$x = -1/2$ is not possible because,

$AD = 4x - 3 = 4(-1/2) - 3 = -2 - 3 = -5$

It means that AD, the length of a side of triangle is negative. which is not possible.

$\therefore$ **$x = 1$**