10th CBSE
CT-3M-Solution

Section: A

1) $\frac{ar(\Delta DEF)}{ar(\Delta ABC)} = \frac{(EF)^2}{(BC)^2} = \frac{121}{64}$

$\therefore \frac{EF}{BC} = \frac{11}{8}$

$\therefore BE = \frac{8 \times 15.4}{11}$

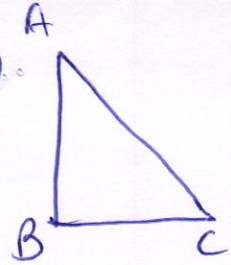
$\therefore \boxed{BC = 11.2\ cm}$

2) Smallest prime no. = 2
Smallest composite no. = 4
HCF(2,4) = 2
LCM(2,4) = 4
$\boxed{HCF(2,4) \times LCM(2,4) = 8}$

3) $(\sec\theta + \tan\theta) = x$
$\rightarrow \sec^2\theta - \tan^2\theta = 1$
$(\sec\theta - \tan\theta)(\sec\theta + \tan\theta) = 1$
$\therefore \boxed{(\sec\theta - \tan\theta) = \frac{1}{x}}$

4) Mean

5) For real & unequal roots,
$D > 0$.
$b^2 - 4ac > 0$
$\Rightarrow 16 - 4(1)(p) > 0$
$\Rightarrow 16 > 4p$
$\Rightarrow \boxed{p < 4}$

6) 

$\sin C = \frac{AB}{AC}$, $\cos C = \frac{BC}{AC}$

$\therefore \sin C + \cos C = \frac{AB+BC}{AC}$

Section : B

7) By Euclid's division lemma,

$a = bq + r, \quad 0 \le r < b$ —i)

put $b = 2$ in i)

$a = 2q + r, \quad 0 \le r < 2$

Case: I : $r = 0$ $\quad a = 2q + 0 = 2q$ = even Int.

case: II : $r = 1$ $\quad a = 2q + 1$ = odd int.
= even + odd

∴ Every positive even Int. is of the form $2q$ and every positive odd int. is of the form $2q+1$, q = some int.

8) $\alpha = 3+\sqrt{5}$, $\beta = 3-\sqrt{5}$

$\alpha + \beta = 6$, $\alpha\beta = 3^2 - 5 = 4$

quadratic eq^n $= x^2 - (\alpha+\beta)x + \alpha\beta$

$= x^2 - 6x + 4$

9) $\frac{AP}{BP} = \frac{AQ}{CQ}$

$\frac{x+2}{2x+3} = \frac{x-4}{2x-7}$

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

$2x^2 - 7x + 4x - 14 = 2x^2 + 3x - 8x - 12$

$2x^2 - 3x - 14 = 2x^2 - 5x - 12$

$x^2 + 2x - 2 = 0$

$2x = 2$

$\boxed{x = 1}$

10)

C.I.	65-85	85-105	105-125	125-145	145-165	165-185
f	4	5	13	20	14	12
Cf	4	9	22	42	56	68

$N/2 = 34$

Median class = 125-145

Modal class = 125-145

→ U.L. of median class - L.L of modal class

$= 145 - 125$

$= 20$

11) $\dfrac{(1 - \tan\theta)/\tan\theta}{(1 + \tan\theta)/\tan\theta} = \dfrac{1 - \sqrt{3}}{1 + \sqrt{3}}$

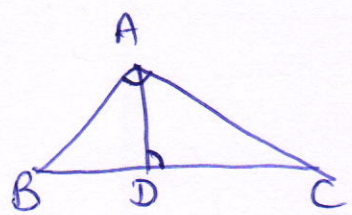
$\dfrac{1 - \tan\theta}{1 + \tan\theta} = \dfrac{1 - \sqrt{3}}{1 + \sqrt{3}}$

$\Rightarrow \tan\theta = \sqrt{3}$

$\tan\theta = \tan 60^\circ$

$\therefore \boxed{\theta = 60^\circ}$

12)



In ΔABC & ΔDAC we have,

$\angle ADC = \angle BAC$ - given

$\angle C = \angle C$ - common

$\therefore$ By AA similarity criterion we have,

$\Delta ABC \sim \Delta DAC$.