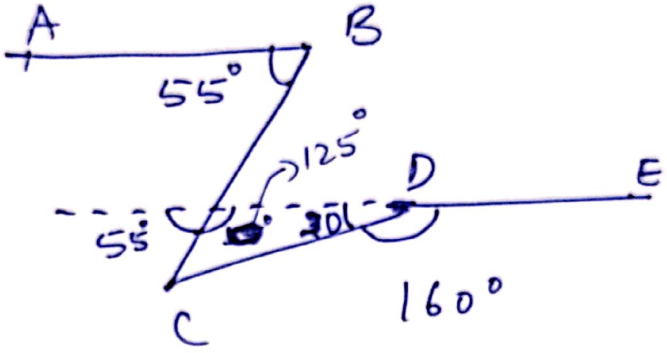
PARALLEL LINES AND TRANSVERSAL

Class: IX, Mathematics

FOUNDATION: SOLUTIONS

TEACHING TASK

01.



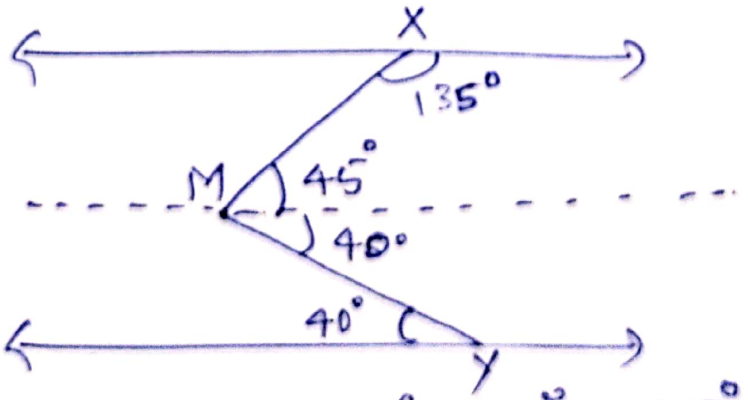
From diagram $125^\circ + 20^\circ + \angle C = 180^\circ$

$\Rightarrow 145^\circ + \angle C = 180^\circ$

$\Rightarrow \angle C = 35^\circ$

Ans: A

02



$\therefore \angle XMY = 45^\circ + 40^\circ = 85^\circ$

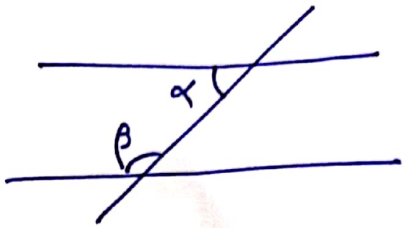
Ans: D

03 $\alpha + \beta = 180^\circ$

$\alpha : \beta = 2 : 3$

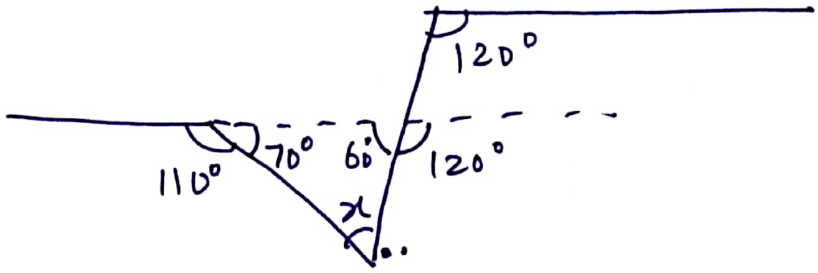
$\beta = \frac{3}{5} \times 180^\circ$

$\beta = 108^\circ$



Ans: A

04.



$70^\circ + 60^\circ + x^\circ = 180^\circ$

$\Rightarrow \quad x = 50^\circ$

Ans: B

05 from figure it is clear,

Linear angle $= 180^\circ$

$x^\circ + 70^\circ + x^\circ = 180^\circ$

$\Rightarrow \quad x = 55^\circ$

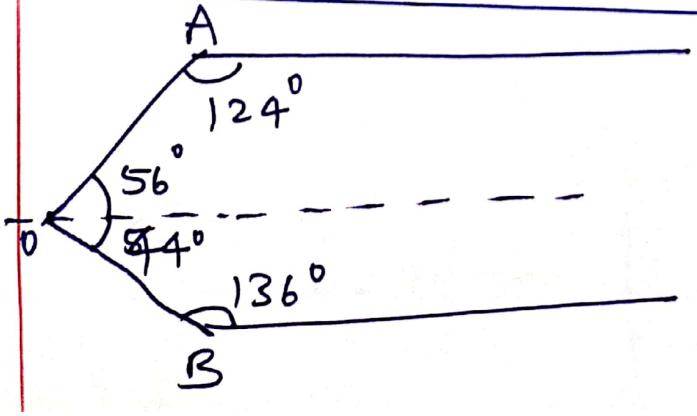
Ans: C

06 $a + 30^\circ + a + 70^\circ = 180^\circ$

$\Rightarrow a = 40^\circ$

Ans: A

07

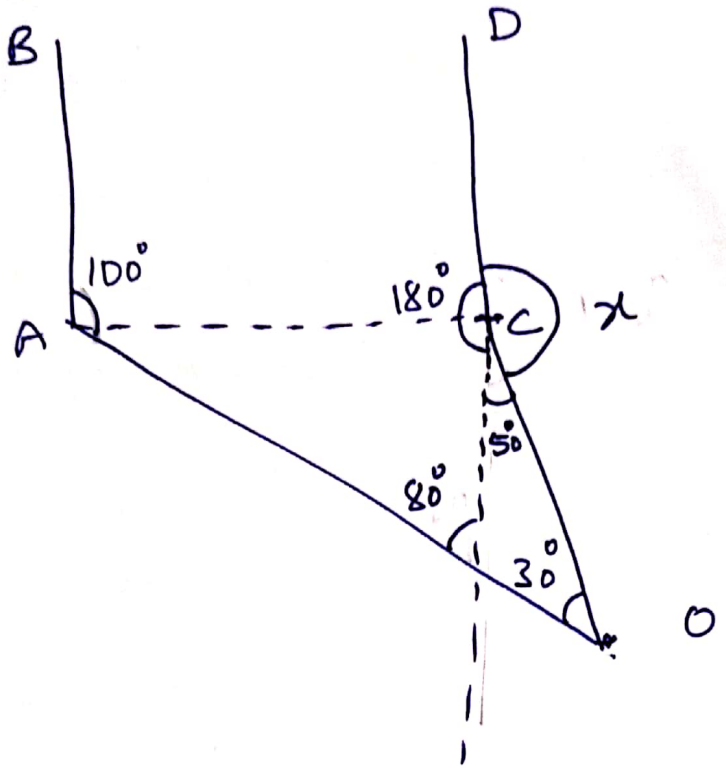


$\therefore \quad \angle AOB = 56^\circ + 44^\circ$

$= 100^\circ$

Ans: C

08



$180^\circ + 50^\circ + x = 360^\circ$

$\Rightarrow \quad x = 130^\circ$

Ans: A

09

$$\frac{x}{84} = \frac{7}{21}$$

$\Rightarrow \quad x = 8\,cm$

Ans: A

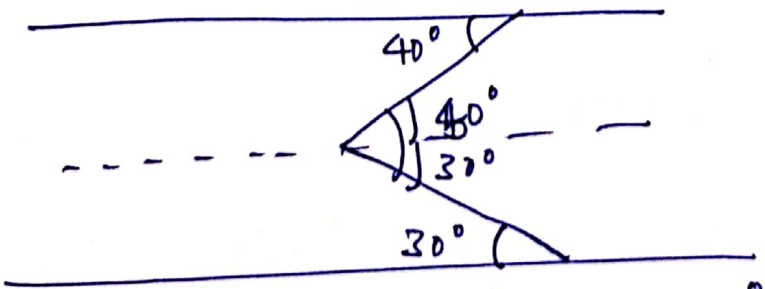
10.

$$\frac{4}{7} = \frac{20}{x}$$

$\Rightarrow \quad x = 35cm$

Ans: D

11.



$b = 40^\circ + 30^\circ$

$= 70^\circ$

$a = 360^\circ - 70^\circ$

$a = 290^\circ$

Ans: A, B

12. $x, y, 55^\circ$ are interesior angles that lie on the same side of the transversal. (4)

We have $x + 55^\circ = 180^\circ$ | $y + 55^\circ = 180^\circ$

$\Rightarrow x = 125^\circ$ | $y = 125^\circ$

Also $z + 55^\circ = 90^\circ$

$\Rightarrow z = 45^\circ$

Ans: A, B

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13. St: $EB = 2AE$

$\Rightarrow \frac{BE}{AE} = \frac{CF}{DF} = 2$

$\Rightarrow \frac{CF}{1.5} = 2$

$\Rightarrow CF = 3$ cm (Given 4 cm) False

Statement II: Conceptual (True).

Ans: D

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14. Statement I:

$\angle 1 = \angle 3 = 70^\circ$

$\angle 3 + \angle 6 = 180^\circ$

$\Rightarrow 70^\circ + \angle 6 = 180^\circ$

$\Rightarrow \angle C = 110^\circ$ (True)

Statement II: Conceptual (True)

Ans. A

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15. $z + x = 180^\circ$

$70^\circ + x = 180^\circ$

$x = 110^\circ$

$\angle x = \angle y$

$\therefore \angle y = 110^\circ$

Ans: A

16. $x + y = 180^\circ$

$\Rightarrow \frac{2y}{3} + y = 180^\circ$ since $3x = 2y \Rightarrow x = \frac{2y}{3}$

$\Rightarrow y = 108^\circ$

$\therefore \angle x = \angle y = 108^\circ$

Ans: B

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17 $\frac{AD}{DB} = \frac{AE}{EC}$

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

$\Rightarrow x = 1$

Ans: 1

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18 $\angle 4 + \angle 6 + \angle 3 + \angle 5$

$= 180^\circ + 180^\circ$

$= 360^\circ = 4 \times 90^\circ$

Ans: 4

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19 from figure

i) $\angle z = 138^\circ$

Also $\angle x = \angle z = 138^\circ$

(ii) $\angle y + 52^\circ = 180^\circ$

$\Rightarrow \angle y = 128^\circ$

(iii) $\angle z = 138^\circ$

(iv) $x + z - y = 138^\circ + 138^\circ - 128^\circ$

$= 148^\circ$

Ans: P, Q, P, F

LEARNERS TASK

CUQ's

01 Conceptual

Ans: B

02 Conceptual

Ans: B

03 $\frac{3}{2} \times 90^\circ = 135^\circ$

Ans: D

04. Let the angle be α

Suplement $\rightarrow 180^\circ - \alpha$

Complement $\rightarrow 90^\circ - \alpha$

Given $180^\circ - \alpha = 4(90^\circ - \alpha)$

$\Rightarrow \alpha = 60^\circ$

Ans: C

05 Conceptual:

Ans: D

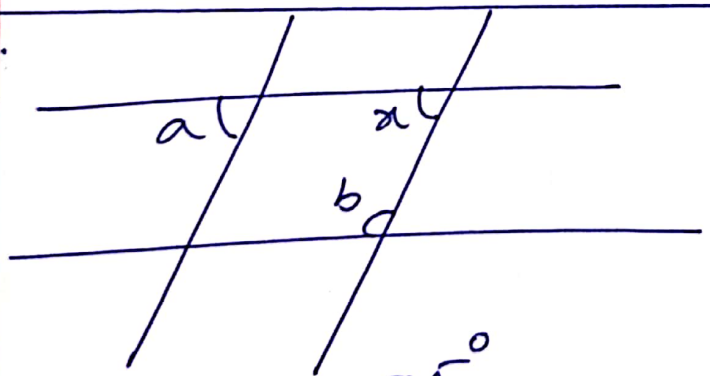
06 $\angle b + \angle c + \angle e \neq 180^\circ$

Ans: C

07 Conceptual

Ans: A

08.



$\angle x = \angle a = 85^\circ$

$\angle b + \angle x = 180^\circ$

$\therefore \angle b + 85^\circ = 180^\circ$

$\therefore \angle b = 95^\circ$

Ans: B

09. $\alpha + 2\alpha = 180^\circ$

$\Rightarrow \alpha = 60^\circ$

greater angle $= 2\alpha = 120^\circ$

Ans: A

10. $\frac{2}{4} = \frac{3}{x}$

$\Rightarrow x = 6\,cm$

Ans: D

JEE MAINS LEVEL

01. Let the angle be α

Suplement $= 180^\circ - \alpha$

Given $\alpha = 180^\circ - \alpha$

$\Rightarrow \alpha = 90^\circ$

Ans: A

02

$\alpha + \beta = 90^\circ$

$\alpha - \beta = 12^\circ$

$2\alpha = 102^\circ$

$\Rightarrow \alpha = 51^\circ$ & $\beta = 39^\circ$

Ans: A

03. Let the angle be α

Complement $= 90^\circ - \alpha$

Given $\alpha + 24^\circ = 90^\circ - \alpha$

$\Rightarrow 2\alpha = 114^\circ$

$\Rightarrow \alpha = 57^\circ$

Ans: D

04. Let the angle be α

Suplement $= 180^\circ - \alpha$

Given $\alpha = \frac{1}{4}(180^\circ - \alpha)$

$\Rightarrow 5\alpha = 180^\circ$

$\Rightarrow \alpha = 36^\circ$

Ans: A

05 Let the angle be α

Complement $\rightarrow 90^\circ - \alpha$

Given $\alpha = \frac{1}{4}(90^\circ - \alpha)$

$\Rightarrow \alpha = 18^\circ$

Ans: B

06. Let two complementary angle be $\alpha, 90^\circ - \alpha$

Given $\alpha : 90^\circ - \alpha = 7 : 11$

$\Rightarrow 11\alpha = 7(90^\circ - \alpha)$

$\Rightarrow 4\alpha = 630$

$\Rightarrow \alpha = 135^\circ$

$\therefore$ other angle $= 55^\circ$

Ans: C

07 from figure

$y = 3x$, Also $y + 2x = 180^\circ$

$3x + 2x = 180^\circ$

$\Rightarrow 5x = 180^\circ$

$\Rightarrow x = 36^\circ$

Also, $y = 3x$

$= 3 \times 36^\circ$

$= 108^\circ$

Ans: B

08 from figure

$y - 5^\circ = 75^\circ$

$\Rightarrow y = 80^\circ$

$2x + 5 = y - 5$

$\Rightarrow 2x + 5 = 80 - 5$

$\Rightarrow x = 35^\circ$

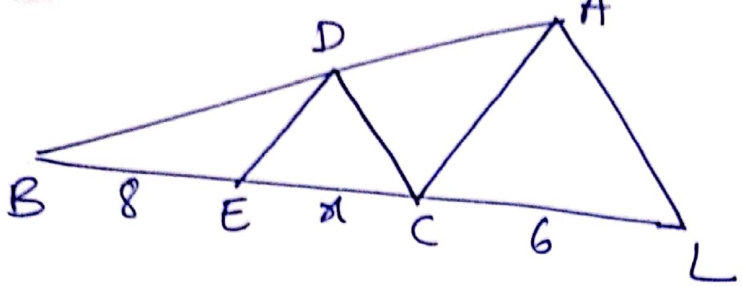
Now $10x - 4y = 10 \times 35^\circ - 4 \times 80^\circ$

$= 350^\circ - 320^\circ$

$= 30^\circ$

Ans: B

09



(9)

We have

$$\frac{BD}{DA} = \frac{BC}{CL} = \frac{8+x}{6}$$

Also

$$\frac{BD}{DA} = \frac{BE}{EC} = \frac{8}{x}$$

$$\therefore \quad \frac{8+x}{6} = \frac{8}{x}$$

$$\Rightarrow \quad x = 4$$

Ans: C

10

$$\frac{OA}{OC} = \frac{AM}{MB}$$

$$\Rightarrow \frac{2.4}{3.6} = \frac{AM}{MB} \Rightarrow \frac{AM}{MB} = \frac{2}{3} \quad \text{i.e. } 2:3$$

Ans: C

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11. from figure

$z = 138^\circ$ (Corresponding angles)

$z = x = 138^\circ$ (vertically opp. angles)

$y + 52^\circ = 180^\circ$

$\Rightarrow \quad y = 128^\circ$

Ans: A, B, D

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12. Statement I: We have $\frac{AB}{AD} = \frac{AC}{AE}$

$$\Rightarrow \frac{AD}{AE} = \frac{AB}{AC} = 1 \Rightarrow AD = AE$$

$\therefore \triangle ADE$ is isosceles (True)

Statement II: Conceptual (True)

Ans: A

13 $2x-5+x-5+4x+3x+20^\circ = 360^\circ$ (10)

$\Rightarrow x = 35^\circ$

Ans: A

14. From figure

$b = z$ (Alternate interior angles)

$\therefore b+y = 360^\circ - 165^\circ$

$\Rightarrow b+y = 195^\circ$

$\Rightarrow z+y = 195^\circ$

$\Rightarrow z + \frac{3z}{2} = 195^\circ$

$\Rightarrow z = 78^\circ$

Ans: 78°

15 From figure

$y = 120^\circ$ (Corresponding angles)

$t = 120^\circ$ (vertically opp. angles)

$\therefore z + 50^\circ = 180^\circ$

$\Rightarrow z = 130^\circ$

Also $z + x = 180^\circ \Rightarrow 130^\circ + x = 180^\circ$

$\Rightarrow x = 50^\circ$

a) $x^\circ = 50^\circ$

b) $y^\circ = 120^\circ$

c) $x^\circ + t^\circ = 50^\circ + 120^\circ = 170^\circ$

d) $z - y = 130^\circ - 120^\circ = 10^\circ$

$\Rightarrow$ THE END $\Leftarrow$

Ans: $\gamma, \rho, s, -$