8. PARALLEL LINES AND TRANSVERSAL

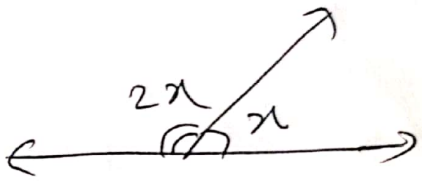
2025/26

Class: IX, MATHEMATICS FOUNDATION. SOLUTIONS

TEACHING TASK
JEE MAINS LEVEL

01. Let the acute angle be x°

Given obtuse angle $= 2x^\circ$



$\therefore \quad x^\circ + 2x^\circ = 180^\circ$

$\Rightarrow \quad x = 60^\circ$

$\therefore$ obtuse angle $= 2x = 2 \times 60^\circ = 120^\circ$

Ans: B

02 NOTE: Please, discard this question, as it has insufficient data.

03 $3x + 5 = 5x - 7$

$\Rightarrow \quad 2x = 12^\circ$

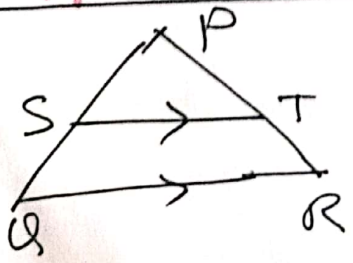
$\Rightarrow \quad x = 6^\circ$

Ans: B

04 NOTE: Please, discard this questions, as it has insufficient data

Ans:—

05



$\frac{PS}{SQ} = \frac{PT}{TR}$

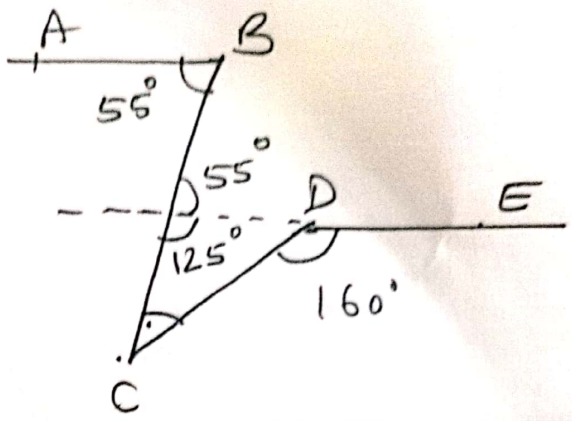
$\frac{3}{6} = \frac{PT}{TR}$

$PT : TR = 1 : 2$

Ans: A

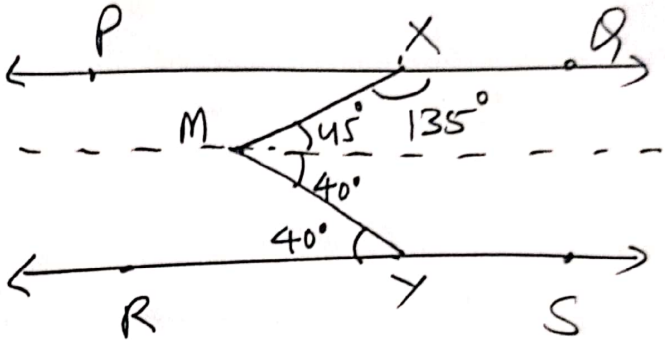
06. $\therefore \angle BCD = 160^\circ - 125^\circ$

$= 35^\circ$



Ans. A

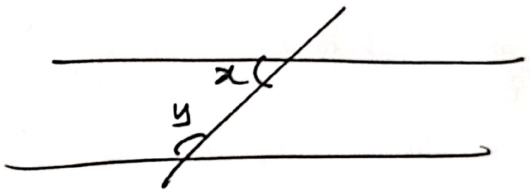
07 $\angle XMY = 85^\circ$



Ans. D

08 $x + y = 180^\circ$.

$x : y = 2 : 3$

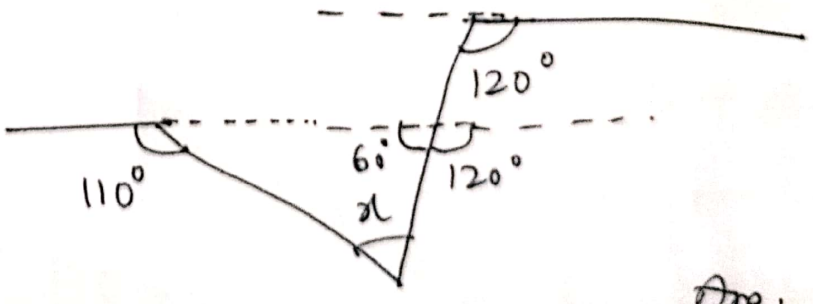


$y = \frac{3}{5} \times 180^\circ$

$= 3 \times 36^\circ = 108^\circ$

Ans: A

09 $x = 50^\circ$



Ans: B

10 $x^\circ + x^\circ + 70^\circ = 110^\circ$

$\Rightarrow x = 55^\circ$

Ans: C

11. $a + 30^\circ + a + 70^\circ = 180^\circ$ (2)

$\Rightarrow 2a = 80^\circ$

$\Rightarrow a = 40^\circ$

Ans: A

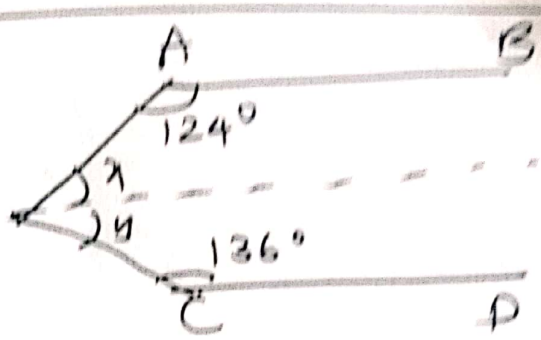
12 $x = 180^\circ - 124^\circ$

$= 56^\circ$

$y = 180^\circ - 136^\circ$

$= 44^\circ$

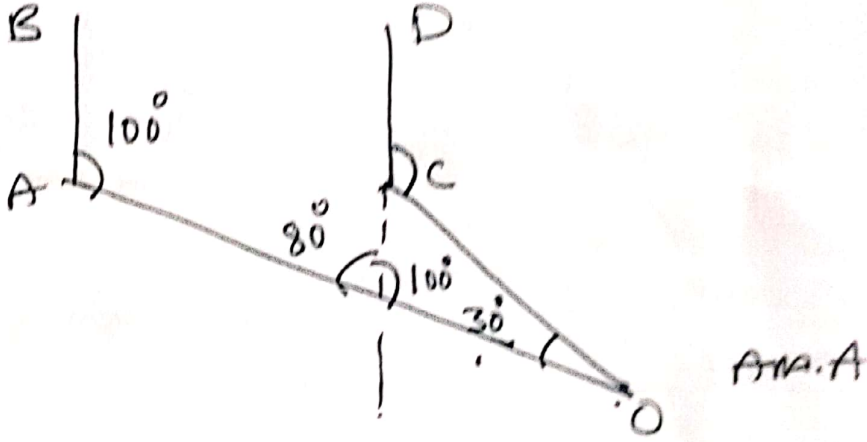
$\therefore x + y = 100^\circ$



Ans: C

13 $\therefore \angle OCD = 100^\circ + 30^\circ$

$= 130^\circ$



Ans. A

14 $\frac{7}{21} = \frac{x}{24}$

$\Rightarrow x = 8$ cm

Ans: A

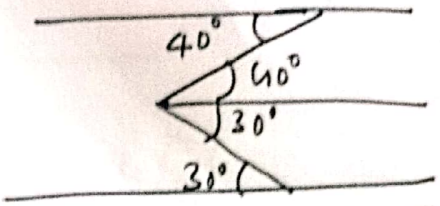
15 $\frac{AB}{BC} = \frac{AD}{DE}$

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

$BC = 35^\circ$

Ans. D

01. $\because \angle b = 30^\circ + 40^\circ$
$= 70^\circ$
$\angle a = 360^\circ - 70^\circ$
$= 290^\circ$



Ans: A, B

02 $z = 90^\circ - 55^\circ = 35^\circ$
$y = 180^\circ - 55^\circ = 125^\circ$
$\therefore \angle x = \angle y = 125^\circ$

Ans. A, B

Ans: A, B, C, D

03 Conceptual

04 Statement I
$\frac{AE}{EB} = \frac{DF}{FC}$
$\Rightarrow \frac{AE}{2AE} = \frac{1.5\,cm}{FC} \Rightarrow FC = 3cm$ (False)

Statement II: Conceptual (True)

Ans: D

05 Statement I: $\angle 1 = 70^\circ$
$\therefore \angle 2 = 180^\circ - 70^\circ = 110^\circ$
$\therefore \angle 6 = \angle 2 = 110^\circ$ (True)

Statement II: Conceptual (True)

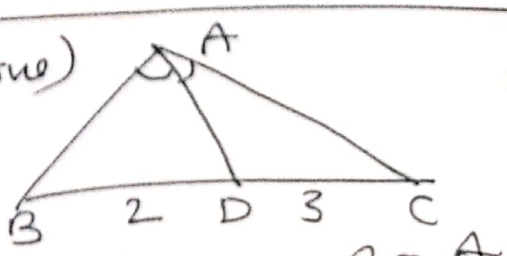
Ans: A

06 Statement I: Conceptual (False)
Statement II: Conceptual (False)

Ans: B

07 Assertion: $\frac{AB}{AC} = \frac{BD}{DC} = \frac{2}{3}$ (True)

Reason: Conceptual (True)



Ans. A

08 Assertion(A) Conceptual (False) (5)

Reason: Conceptual (True)

Ans: C

09 $x = 180^\circ - 70^\circ = 110^\circ$

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

Ans: A

10. We have $x + y = 180^\circ$

$3x = 2y \Rightarrow x : y = 2 : 3$

$y = \frac{3}{5} \times 180^\circ = 3 \times 36^\circ = 108^\circ$

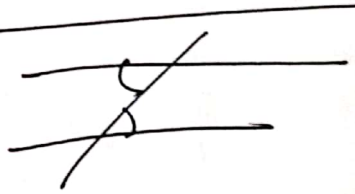
Ans: B

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

11. $3x - 15^\circ = x + 45^\circ$

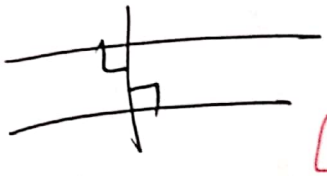
$\Rightarrow 2x = 60^\circ$

$\Rightarrow x = 30^\circ$



Ans: C

12 Conceptual



Ans: A

13 $\frac{AD}{DB} = \frac{AE}{EC}$

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

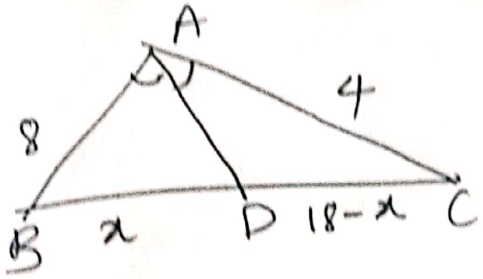
$\Rightarrow$ clearly, $x = 1$ satisfies the above eqn Ans: 1

14 $\angle 4 + \angle 6 + \angle 3 + \angle 5 = 360^\circ = 4 \times 90^\circ$

Ans: 4

15

15



$$\frac{8}{4} = \frac{x}{18-x}$$

$$\Rightarrow x = 36 - 2x$$

$$\Rightarrow x = 12$$

Ans: 12

16

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

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

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

Ans: P, Q, P, t

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

$= 148^\circ$

17

a) $5x - 10^\circ + x + 50^\circ = 180^\circ$

$\Rightarrow 6x = 180^\circ - 40^\circ = 140^\circ$

$\Rightarrow x = \frac{70^\circ}{3}$

b) $3x - 5 = x + 25$

$\Rightarrow 2x = 30$

$\Rightarrow x = 15^\circ$ (Q)

c) $x = 2(90^\circ - x)$

$\Rightarrow 3x = 180^\circ$

$\Rightarrow x = 60^\circ$

d) $2x + 7x = 180^\circ$

$\Rightarrow 9x = 180^\circ$

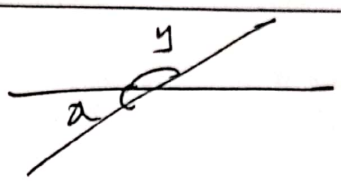
$\Rightarrow x = 20^\circ$

$2x = 2 \times 20^\circ = 40^\circ$

$7x = 7 \times 20^\circ = 140^\circ$ (S)

Ans: —, Q, —, S

LEARNER'S TASK (CUQ'S)

01	Conceptual	Ans. A
02	Please discard this problem, as it has ~~data~~ insufficient data	
03	65°	~~Ans.~~ A
04	Conceptual	Ans: B
05	$x : y = 1 : 3$; $x + y = 180^\circ$  $x = \frac{1}{4} \times 180^\circ$ $= 45^\circ$	Ans: B
06	Conceptual	Ans: B
07	Conceptual	Ans: A
08	$\frac{3}{2} \times 90^\circ = 135^\circ$	Ans: D
09	let the angle be x Gives $180^\circ - x = 4(90^\circ - x)$ $\Rightarrow 180^\circ - x = 360^\circ - 4x$ $\Rightarrow 3x = 180^\circ \Rightarrow x = 60^\circ$	Ans: C
10	Conceptual ~~(C)~~	Ans: D
11	Conceptual	Ans: C
12	Conceptual	Ans: A

13. $\angle a + \angle b = 180^\circ$

$85^\circ + \angle b = 180^\circ \Rightarrow \angle b = 95^\circ$

$180 - 85 = 95$ (8)

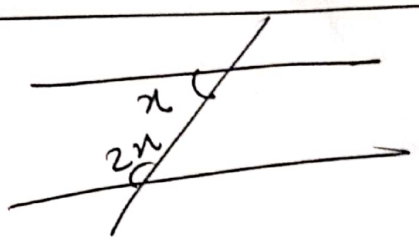
Ans. B

14 $x^\circ + 2x^\circ = 180^\circ$

$\Rightarrow x^\circ = 60^\circ$

Greater angle $= 2x^\circ$

$= 120^\circ$



Ans: A

15 $\frac{2}{4} = \frac{3}{HJ} \Rightarrow HJ = 6\text{cm}$

Ans: D

JEE MAINS LEVEL

01 let the angle be x

Complement $= 90^\circ - x$

Given $x = \frac{1}{3}(90^\circ - x)$

$= 3x = 90^\circ - x$

$\Rightarrow 4x = 90^\circ$

$\Rightarrow x = 22\frac{1}{2}^\circ$

Ans: A

02 $x + 2x^\circ = 180^\circ$

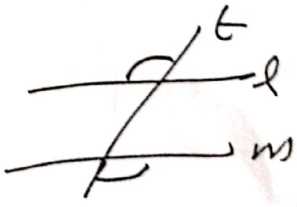
$\Rightarrow x = 60^\circ$

Ans: A

03 $4x + 10^\circ = 6x - 20^\circ$

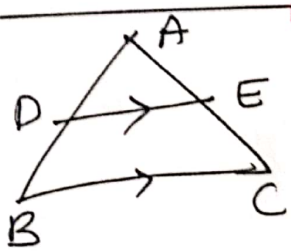
$\Rightarrow 2x = 30^\circ$

$\Rightarrow x = 15^\circ$



Ans: A

04 $AE : EC = 2 : 3$



Ans. B

05 $x + 40^\circ = 3x - 20^\circ$

$\Rightarrow 2x = 60^\circ$

$\Rightarrow x = 30^\circ$

Ans: ~~A~~

06 90°

Ans. A

07 Let the angle be x & $x - 12^\circ$

Given $x + x - 12^\circ = 90^\circ$

$\Rightarrow x = 51^\circ, 39^\circ$

Ans: A

08 $x^\circ = 24^\circ + (90^\circ - x)$

$\Rightarrow 2x = 114^\circ \Rightarrow x = 57^\circ$

Ans. D

09 $x = \frac{1}{4}(180^\circ - x)$

$\Rightarrow 5x = 180^\circ \Rightarrow x = 36^\circ$

Ans. A

10 $x = \frac{1}{4}(90^\circ - x$

$\Rightarrow 5x = 90^\circ \Rightarrow x = 18^\circ$

Ans B

11 $x : 90^\circ - x = 7 : 11$

$\Rightarrow 11x = 630^\circ - 7x$

$\Rightarrow 18x = 630^\circ$

$\Rightarrow x = 35^\circ$

$\therefore 90^\circ - x = 55^\circ$

Ans: C

12 $y = 3x$ and $y + 2x = 180^\circ$

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

$\Rightarrow x = 36^\circ$

$\therefore y = 3 \times 36^\circ = 108^\circ$

Ans. B

13 $2x + 5^\circ = 75^\circ$ | $y - 5^\circ = 75^\circ$ (10)

$x = 35^\circ$ | $y = 80^\circ$

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

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

$= 30^\circ$

Ans. B

14 From figure

$\frac{BD}{DA} = \frac{BE}{EC}$ and $\frac{BD}{DA} = \frac{BC}{CL}$

$\therefore \frac{BE}{EC} = \frac{BC}{CL}$

$\Rightarrow \frac{8}{x} = \frac{8+x}{6}$

$\Rightarrow 8x + x^2 = 48$

$\Rightarrow x^2 + 8x - 48 = 0$

$\Rightarrow (x+12)(x-4) = 0 \Rightarrow x = 4\text{ cm}$

Ans: C

15 $\frac{AM}{MB} = \frac{AO}{OC} = \frac{2.4}{3.6} = \frac{2}{3}$ Ans: C

JEE ADVANCED LEVEL

01. $Z = 138^\circ$, $x = 138^\circ$, $y + 52^\circ = 180^\circ \Rightarrow y = 128^\circ$

Ans ~~A~~ A, B, D

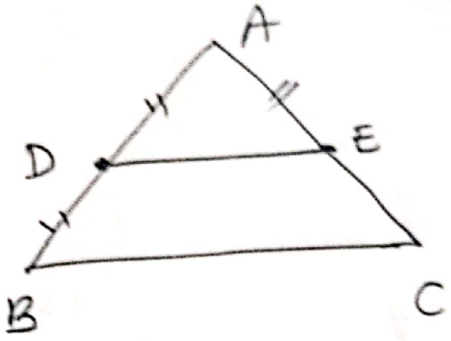
02 $4x - 10^\circ + 2x + 20^\circ = 180^\circ$

$\Rightarrow x = \frac{85^\circ}{3}$

Conceptually (True)

Ans. B, C, D

03. Statement I:



We have $AB = AC$

$\Rightarrow \frac{AB}{2} = \frac{AC}{2}$

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

$\therefore \triangle ADE$ is isosceles $\Rightarrow AE = EC$

(True).

Statement II: Conceptual (True) Ans. A

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04 Statement I: Two complementary angles add upto 90° (False)

Statement II: conceptual (True) Ans: D

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05 Assertion: $x = \frac{1}{3}(90^\circ - x) \Rightarrow x = \frac{90^\circ}{4}$ (True)

Reason: Conceptual (False) Ans: C

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06 Assertion: Conceptual (False)

Reason: Conceptual (True) Ans: C

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07 $2x - 5 + 3x + 20 + 4x + x - 5 = 360^\circ$

$\Rightarrow 10x + 10^\circ = 360^\circ$

$\Rightarrow x = 35^\circ$ Ans: A

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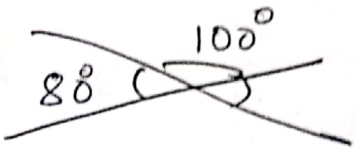
08 $5x - 20^\circ + 3x + 40^\circ = 180^\circ$ (12)

$\Rightarrow 8x = 160^\circ \Rightarrow x = 20^\circ$ Ans: B

09 $5x - 20^\circ = 5(20) - 20^\circ$

$= 80^\circ$

and 100°



Ans: A, D

10 From the diagram

$y + b + p = 360^\circ$

$\Rightarrow \frac{3z}{2} + z + 165^\circ = 360^\circ$ Since $2y = 3z$

$y = \frac{3z}{2}$

$\Rightarrow \frac{5z}{2} = 195^\circ$ and $b = z$

$\Rightarrow z = 78^\circ$

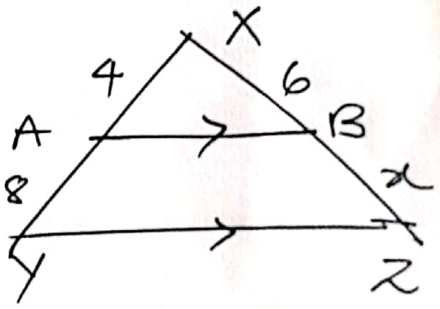
Ans. 78°

11 Given XB = 6 cm

$\frac{XA}{AY} = \frac{XB}{BZ}$

$\Rightarrow \frac{4}{8} = \frac{6}{x}$

$\Rightarrow x = 12$ cm



Ans 12

12 a) 50° (r)

b) 120° (p)

c) $t = 120^\circ$

$\therefore x + t = 50^\circ + 120^\circ = 170^\circ$ (s)

d) $z^\circ = 130^\circ$

$z - y = 130 - 120^\circ$

$= 10^\circ$ ( ) Ans: r, p, s, —

13 a) (q)

b) (p)

c) (s)

d) (r)

Ans: q, p, s, r

⇒ THE END ⇐