

# LINES & ANGLES

## रेखा और कोण

### PRACTICE SHEET

#### WITH SOLUTIONS

#### BY ADITYA RANJAN

 Maths By Aditya Ranjan

 Rankers Gurukul

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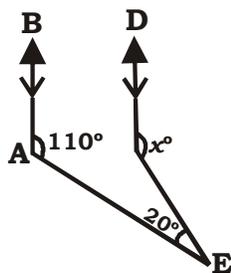
# Lines and Angles / रेखा और कोण

## (Practice Sheet With Solution)

### Level-01

1. In the given figure find  $x$ .

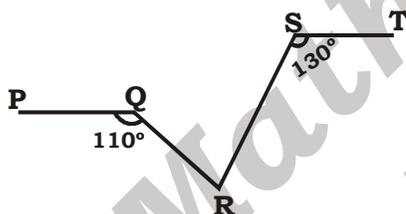
दिये गये चित्र में  $x$  का मान ज्ञात करें।



- (a)  $110^\circ$  (b)  $130^\circ$   
(c)  $105^\circ$  (d)  $90^\circ$

2. In the figure, if  $PQ \parallel ST$ ,  $\angle PQR = 110^\circ$  and  $\angle RST = 130^\circ$ , then  $\angle QRS = ?$

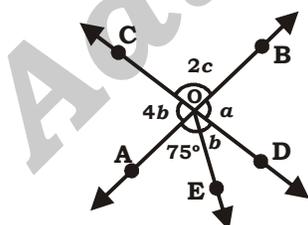
दिये गये चित्र में यदि  $PQ \parallel ST$ ,  $\angle PQR = 110^\circ$  और  $\angle RST = 130^\circ$  है, तो  $\angle QRS = ?$



- (a)  $50^\circ$  (b)  $60^\circ$   
(c)  $40^\circ$  (d)  $45^\circ$

3. In the figure, two straight lines AB and CD intersect each other at O. If  $\angle AOE = 75^\circ$ , find the value of  $a$ ,  $b$  and  $c$  respectively.

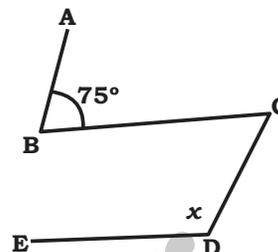
चित्र में, दो सीधी रेखाएँ AB और CD एक-दूसरे को बिन्दु O पर प्रतिच्छेदित करते हैं। यदि  $\angle AOE = 75^\circ$  है तो  $a$ ,  $b$  और  $c$  के मान ज्ञात करें।



- (a)  $84^\circ, 21^\circ, 48^\circ$  (b)  $21^\circ, 84^\circ, 48^\circ$   
(c)  $48^\circ, 21^\circ, 84^\circ$  (d)  $21^\circ, 48^\circ, 84^\circ$

4. If in the given, figure,  $AB \parallel CD$  and  $BC \parallel DE$ , then find  $x$ .

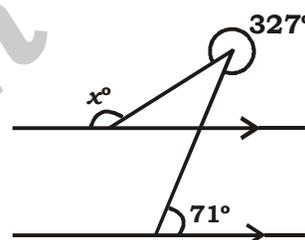
यदि दी गई आकृति में,  $AB \parallel CD$  और  $BC \parallel DE$  है, तो  $x$  ज्ञात कीजिए।



- (a)  $95^\circ$  (b)  $105^\circ$   
(c)  $115^\circ$  (d)  $125^\circ$

5. Find the values of  $x$  ?

$x$  का मान ज्ञात करें।



- (a)  $142^\circ$  (b)  $141^\circ$   
(c)  $143^\circ$  (d)  $144^\circ$

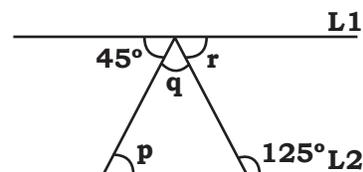
6. If LM is any line and P is any point not lying on LM, then the number of lines perpendicular to LM and passing through point P is/are :

यदि LM कोई रेखा है और P कोई ऐसा बिन्दु है जो LM पर स्थित नहीं है। तो P से होकर गुजरने वाली और LM पर लंबवत् कितनी रेखाएँ खींची जा सकती है?

- (a) 0 (b) 1  
(c) 2 (d) infinite

7. In the following figure, lines L1 and L2 are parallel to each other. Find the value of  $q$ .

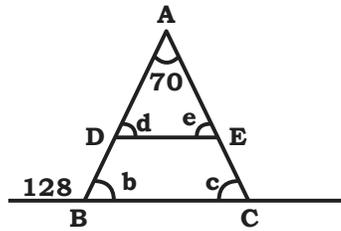
निम्नलिखित आकृति में, रेखाएँ L1 और L2 एक दूसरे के समानांतर हैं।  $q$  का मान ज्ञात कीजिए।



- (a)  $60^\circ$  (b)  $80^\circ$   
(c)  $90^\circ$  (d)  $85^\circ$

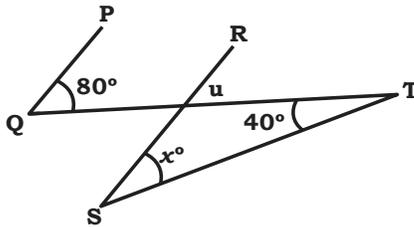
8. In the given diagram if  $BC \parallel ED$  and  $\angle BAC = 70^\circ$ , then find the value  $d$  and  $c$ .

दिए गए आरेख में यदि  $BC \parallel ED$  और  $\angle BAC = 70^\circ$  है, तो  $d$  और  $c$  का मान ज्ञात कीजिए।



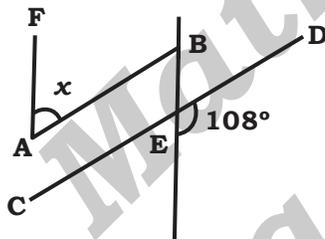
- (a)  $52^\circ, 58^\circ$                       (b)  $58^\circ, 52^\circ$   
 (c)  $44^\circ, 36^\circ$                       (d)  $36^\circ, 44^\circ$

9. If  $PQ \parallel RS$ , then find the value of  $x$ .  
 यदि  $PQ \parallel RS$  है, तो  $x$  का मान ज्ञात कीजिए।



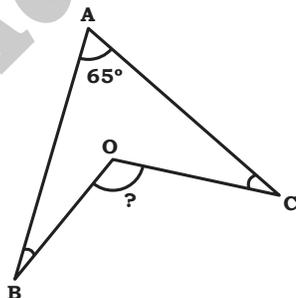
- (a)  $40^\circ$                                       (b)  $60^\circ$   
 (c)  $70^\circ$                                       (d)  $80^\circ$

10. If  $AB \parallel CD$  and  $AF \parallel BE$ , then find the value of  $x$  is.  
 यदि  $AB \parallel CD$  और  $AF \parallel BE$  है, तो  $x$  का मान ज्ञात कीजिए।



- (a)  $108^\circ$                                       (b)  $72^\circ$   
 (c)  $88^\circ$                                       (d)  $82^\circ$

11. In the given figure,  $\angle BAC = 65^\circ$ ,  $\angle ABO = 25^\circ$ ,  $\angle ACO = 30^\circ$  find  $\angle BOC$   
 दिए गए चित्र में  $\angle BAC = 65^\circ$ ,  $\angle ABO = 25^\circ$ ,  $\angle ACO = 30^\circ$   $\angle BOC$  मान ज्ञात कीजिए।

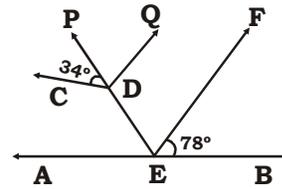


- (a)  $100^\circ$                                       (b)  $110^\circ$   
 (c)  $90^\circ$                                       (d)  $120^\circ$

**Level-02**

12. In the given figure  $AB \parallel CD$  and  $EF \parallel DQ$ , find the value of  $\angle PDQ$ .

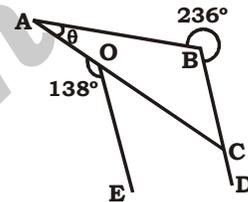
दिये गये चित्र में  $AB \parallel CD$  तथा  $EF \parallel DQ$  तो  $\angle PDQ$  का मान ज्ञात करें।



- (a)  $68^\circ$   
 (b)  $78^\circ$   
 (c)  $56^\circ$   
 (d) None of these

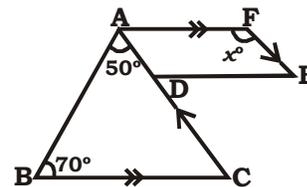
13. In the shown figure,  $OE \parallel BD$ , find the value of  $\theta$ .

दिये गये चित्र में  $OE \parallel BD$ ,  $\theta$  का मान ज्ञात करें।



- (a)  $19^\circ$                                       (b)  $12^\circ$   
 (c)  $14^\circ$                                       (d)  $15^\circ$

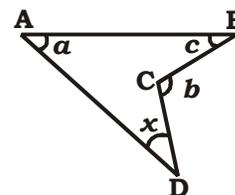
14. In the given figure find the value of  $x$ ?  
 दिये गये चित्र में  $x$  का मान ज्ञात करें।



- (a)  $110^\circ$                                       (b)  $100^\circ$   
 (c)  $120^\circ$                                       (d)  $90^\circ$

15. What is the value of  $x$  in the figure given below.

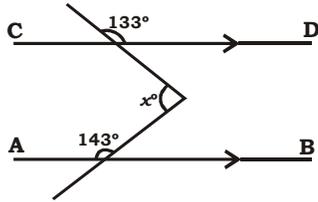
नीचे दिए गए चित्र में  $x$  का मान क्या होगा?



- (a)  $b - a - c$                                       (b)  $b - a + c$   
 (c)  $b + a - c$                                       (d)  $\pi - (a + b - c)$

16. Find the values of  $x$ ?

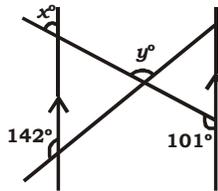
$x$  का मान ज्ञात करें।



- (a)  $79^\circ$  (b)  $81^\circ$   
 (c)  $89^\circ$  (d)  $84^\circ$

17. Find the value of  $x$  and  $y$ .

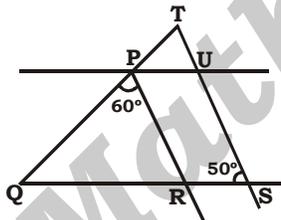
$x$  और  $y$  का मान ज्ञात करें।



- (a)  $79^\circ, 117^\circ$  (b)  $87^\circ, 115^\circ$   
 (c)  $81^\circ, 121^\circ$  (d)  $73^\circ, 150^\circ$

18. In the figure given,  $PR \parallel TS$  and  $PU \parallel RS$ . Find  $\angle TPU$  (in degrees).

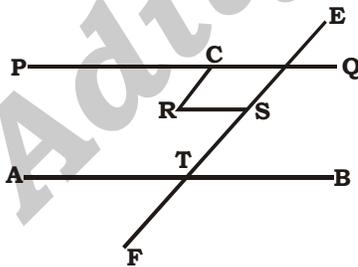
दिये गये चित्र में  $PR \parallel TS$  और  $PU \parallel RS$  है, तो  $\angle TPU$  का मान (डिग्री में) ज्ञात करें।



- (a)  $50^\circ$  (b)  $70^\circ$   
 (c)  $40^\circ$  (d)  $60^\circ$

19. In the given figure  $PQ \parallel AB$ ,  $AB \parallel RS$  and  $RC \parallel EF$ . If  $\angle CRS = 50^\circ$ , find  $\angle STA$  (in degrees).

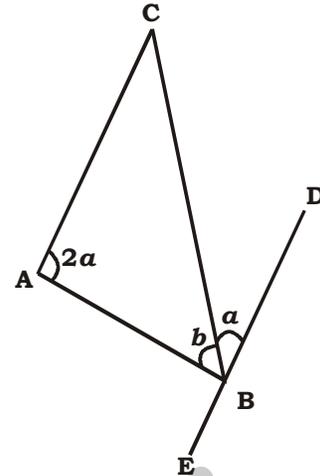
दिये गये चित्र में  $PQ \parallel AB$ ,  $AB \parallel RS$  और  $RC \parallel EF$  है। यदि  $\angle CRS = 50^\circ$  है, तो  $\angle STA$  का मान ज्ञात करें (डिग्री में)



- (a)  $130^\circ$  (b)  $115^\circ$   
 (c)  $140^\circ$  (d)  $110^\circ$

20. In the given figure, If  $AC, DE$  are parallel and  $\angle CAB = 38^\circ$ , then the value of  $\angle ABC + 5\angle CBD$  is:

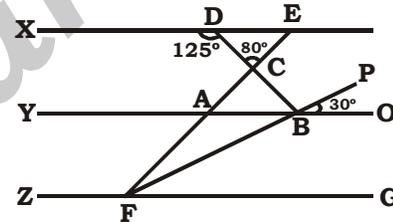
दिये गये चित्र में  $AC, DE$  समांतर हैं और  $\angle CAB = 38^\circ$  है, तो  $\angle ABC + 5\angle CBD$  का मान है:



- (a)  $158^\circ$  (b)  $178^\circ$   
 (c)  $218^\circ$  (d)  $196^\circ$

21. Three straight lines  $x, y, z$  are parallel and angles are according to given figure. Find the value of  $\angle AFB$ ?

दिये गये चित्रानुसार कोण और तीन सीधी रेखाएँ  $x, y, z$  समांतर हैं।  $\angle AFB$  का मान ज्ञात करें।



- (a)  $20^\circ$  (b)  $30^\circ$   
 (c)  $15^\circ$  (d)  $10^\circ$

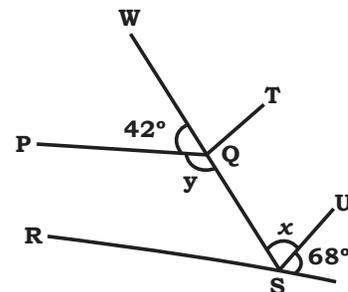
22. A wheel makes 15 revolutions per minutes. The angle in radian described by a spoke of the wheel in 7 second is :

एक पहिया प्रति मिनट 15 चक्कर लगाता है। 7 सेकेण्ड में पहिये के चक्र द्वारा बनाया गया कोण रेडियन में ज्ञात करें।

- (a)  $\frac{5\pi}{2}$  (b)  $\frac{7\pi}{2}$   
 (c)  $\frac{3\pi}{5}$  (d)  $\frac{4\pi}{5}$

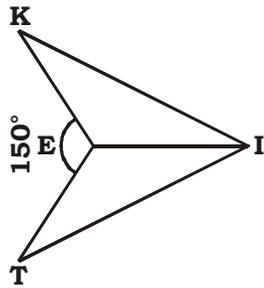
23. If  $PQ \parallel RS$  and  $QT \parallel SU$ , then find the value of  $x + y$ .

यदि  $PQ \parallel RS$  और  $QT \parallel SU$  है, तो  $x + y$  का मान ज्ञात कीजिए।



- (a)  $188^\circ$  (b)  $202^\circ$   
 (c)  $208^\circ$  (d)  $212^\circ$
24. In the given figure, if  $KI = IT$  and  $EK = ET$ , then  $\angle TEI = \underline{\hspace{2cm}}$ .

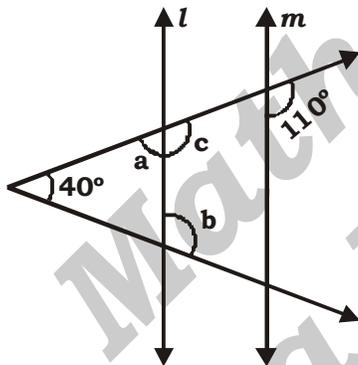
दी गई आकृति में, यदि  $KI = IT$  और  $EK = ET$  है, तो  $\angle TEI =$



SSC CGL 13/12/2022 (Shift- 04)

- (a)  $75^\circ$  (b)  $125^\circ$   
 (c)  $105^\circ$  (d)  $150^\circ$
25. In the following figure, if  $l \parallel m$ , then find the measures of angles marked by a and b.

निम्नलिखित आकृति में यदि  $l \parallel m$  है तो a और b द्वारा चिह्नित कोणों की माप ज्ञात करें।



SSC CGL 08/12/2022 (Shift- 04)

- (a)  $a = 90^\circ$  and  $b = 90^\circ$   
 (b)  $a = 55^\circ$  and  $b = 125^\circ$   
 (c)  $a = 70^\circ$  and  $b = 110^\circ$   
 (d)  $a = 60^\circ$  and  $b = 120^\circ$

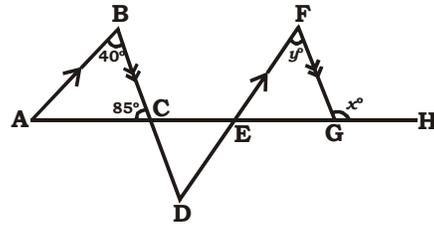
**Level-03**

26. If a straight line L make angle  $\theta$  ( $\theta > 90^\circ$ ) with the positive direction of X axis, the acute angle made by a straight line  $L_1$ , perpendicular to L, with Y axis is :

यदि एक सरल रेखा L धनात्मक X अक्ष से  $\theta$  ( $\theta > 90^\circ$ ) का कोण बनाती है तब एक दूसरी रेखा  $L_1$  जो रेखा L पर लम्बवत है, Y अक्ष से कितना कोण बनाएगी?

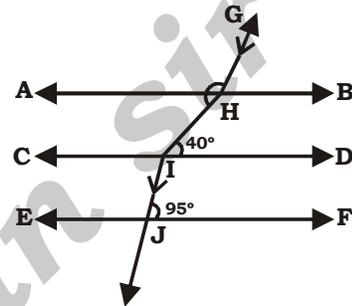
- (a)  $\frac{\pi}{2} + \theta$  (b)  $\frac{\pi}{2} - \theta$   
 (c)  $\pi + \theta$  (d)  $\pi - \theta$

27. In the figure find x and y.  
 दिये गये चित्र में x और y का मान ज्ञात करें।



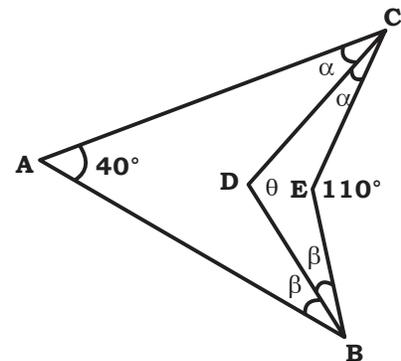
- (a)  $45^\circ, 95^\circ$  (b)  $55^\circ, 95^\circ$   
 (c)  $95^\circ, 40^\circ$  (d)  $90^\circ, 45^\circ$

28. In the figure find  $\angle GHI$ .  
 दिये गये चित्र में  $\angle GHI$  का मान ज्ञात करें।



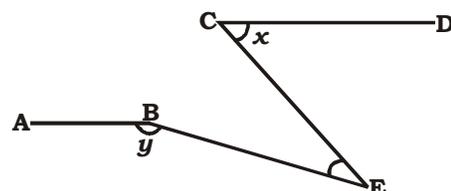
- (a)  $135^\circ$  (b)  $140^\circ$   
 (c)  $115^\circ$  (d)  $125^\circ$

29. Find the value of  $\theta$ .  
 $\theta$  का मान ज्ञात करें।



- (a)  $60^\circ$  (b)  $70^\circ$   
 (c)  $75^\circ$  (d)  $\angle CND$

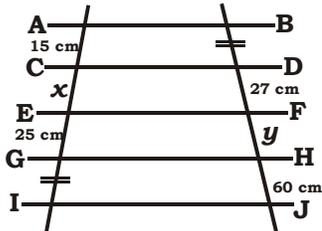
30. In the figure given below AB is parallel to CD. If  $\angle DCE = x$  and  $\angle ABE = y$  then  $\angle CEB$  is equal to :  
 दिए गए चित्र में  $AB \parallel CD$ , यदि  $\angle DCE = x$  तथा  $\angle ABE = y$  तो  $\angle CEB = ?$



- (a)  $y - x$  (b)  $\frac{x + y}{2}$   
 (c)  $x + y - \frac{\pi}{2}$  (d)  $x + y - \pi$

31. In the given figure  $AB \parallel CD \parallel EF \parallel GH \parallel IJ$ , find the value of  $x + y$  ?

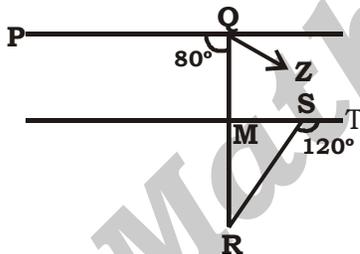
नीचे दिए गए चित्र में  $AB \parallel CD \parallel EF \parallel GH \parallel IJ$ ,  $x + y$  का मान ज्ञात करें।



- (a) 64 (b) 63.5  
 (c) 59 (d) 67.5

32. In the following figure,  $\angle RQZ = 2\angle QRS$  and  $PQ \parallel ST$ . Find  $\angle RQZ$ .

दिये गये चित्र में  $\angle RQZ = 2\angle QRS$  तथा  $PQ \parallel ST$  है, तो  $\angle RQZ$  का मान है :

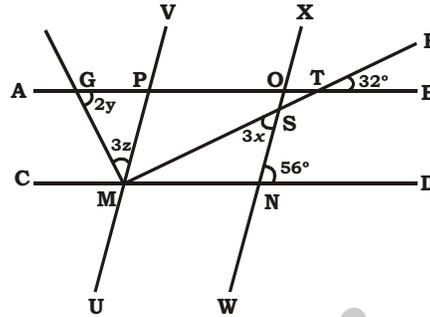


- (a)  $20^\circ$  (b)  $30^\circ$   
 (c)  $40^\circ$  (d)  $60^\circ$

33. In the given figure  $AB \parallel CD$ ,  $UV \parallel WX$ ,  $\angle XND = 56^\circ$ ,  $\angle GMT = 90^\circ$  and  $\angle ETB = 32^\circ$ . Find the value of  $\frac{x + 2y + z}{8}$  ?

दिये गये चित्र में  $AB \parallel CD$ ,  $UV \parallel WX$ ,  $\angle XND = 56^\circ$ ,  $\angle GMT = 90^\circ$  और  $\angle ETB = 32^\circ$  है।

$\frac{x + 2y + z}{8}$  का मान ज्ञात करें।



- (a) 11 (b) 20  
 (c) 15 (d) 18

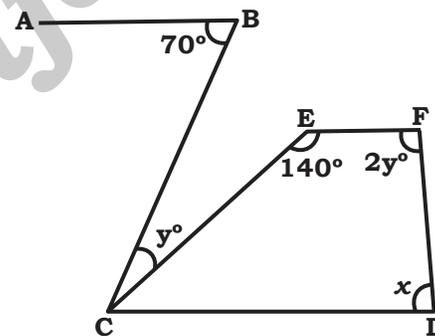
34. The complement angle of  $30^\circ 20'$  is :

$30^\circ 20'$  का पूरक कोण ज्ञात करें।

- (a)  $69^\circ 40'$  (b)  $59^\circ 40'$   
 (c)  $35^\circ 80'$  (d)  $159^\circ 40'$

35. In the figure, if  $CD \parallel EF \parallel AB$  then find the value of  $x$ .

चित्र में, यदि  $CD \parallel EF \parallel AB$  है तो  $x$  का मान ज्ञात कीजिए।



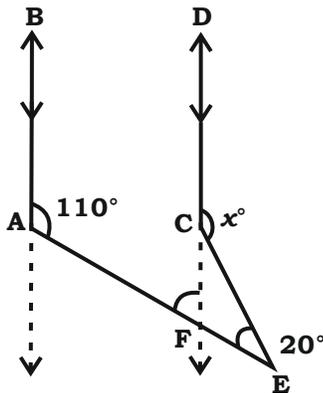
- (a)  $70^\circ$  (b)  $90^\circ$   
 (c)  $110^\circ$  (d)  $120^\circ$

### Answer Key

1.(b)	2.(b)	3.(a)	4.(b)	5.(a)	6.(b)	7.(b)	8.(a)	9.(a)	10.(b)
11.(d)	12.(a)	13.(c)	14.(c)	15.(a)	16.(d)	17.(a)	18.(b)	19.(a)	20.(c)
21.(c)	22.(b)	23.(c)	24.(c)	25.(c)	26.(d)	27.(c)	28.(d)	29.(c)	30.(d)
31.(b)	32.(c)	33.(a)	34.(b)	35.(d)					

# SOLUTIONS

1. (b)



I. we can clearly see by figure that  $x^\circ > 110^\circ$

$\therefore$  by options only option (b)  $130^\circ$  is suitable option

II. Extend lines BA and DC.

$$\angle DFA = \angle FEC + \angle ECF$$

[Exterior angle]

$$\begin{aligned} \Rightarrow \angle DFA &= 20^\circ + (180^\circ - x^\circ) \\ &= 200^\circ - x^\circ \quad \dots\dots(1) \end{aligned}$$

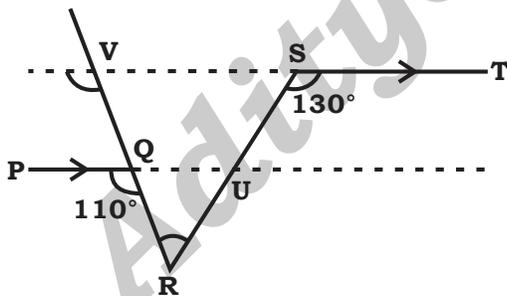
Also,  $BA \parallel CD$

$$\begin{aligned} \Rightarrow \angle DFA &= 180^\circ - \angle BAF \\ &= 180^\circ - 110^\circ \\ &= 70^\circ \quad \dots\dots(2) \end{aligned}$$

From (1) and (2)

$$\begin{aligned} 200^\circ - x^\circ &= 70^\circ \\ \Rightarrow x &= 130^\circ \end{aligned}$$

2. (b)



Extend TS and PQ

Such that,  $VT \parallel PU$

$$\angle VSR = 180^\circ - 130^\circ = 50^\circ$$

$$\text{Also, } \angle VSU = \angle QUR = 50^\circ$$

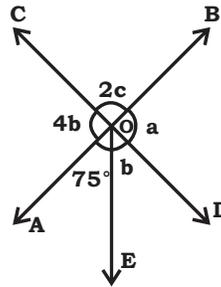
[corresponding angles]

$$\angle RQU = 180^\circ - 110^\circ = 70^\circ$$

$\therefore$  In  $\triangle QRU$ :-

$$\angle QRU = (180^\circ - 70^\circ - 50^\circ) = 60^\circ$$

3. (a)



We know, by linear angle property:-

$$5b + 75^\circ = 180^\circ$$

$$\Rightarrow b = 21^\circ$$

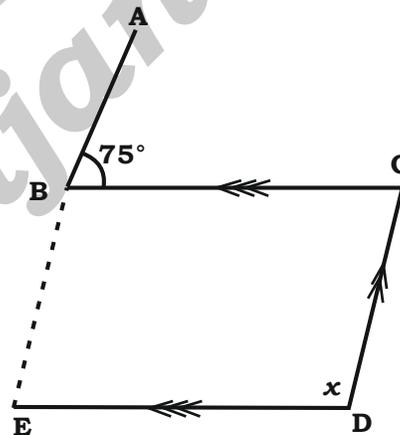
$$\text{Also, } a = (180^\circ - 75^\circ - b)$$

$$\Rightarrow a = (180^\circ - 75^\circ - 21^\circ) = 84^\circ$$

$$\text{and } 2c = 180^\circ - a = 180^\circ - 84^\circ$$

$$\Rightarrow C = 48^\circ$$

4. (b)



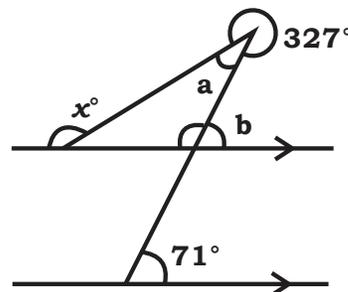
Extend AB upto E.

$$\angle CBE = 180^\circ - 75^\circ \text{ (Linear angle)} = 105^\circ$$

Also, EDCB is a parallelogram

$$\Rightarrow x = 105^\circ$$

5. (a)



From figure:-

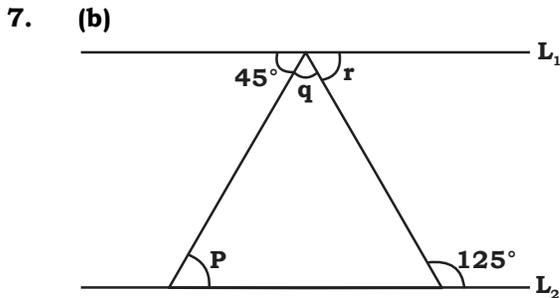
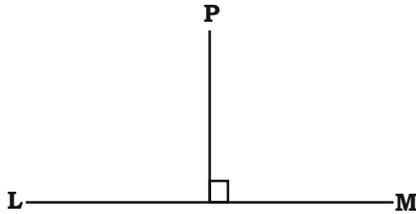
$$x = a + (180 - b) \quad \dots\dots(1) \text{ [Exterior angle]}$$

$$a = 360^\circ - 327^\circ = 33^\circ$$

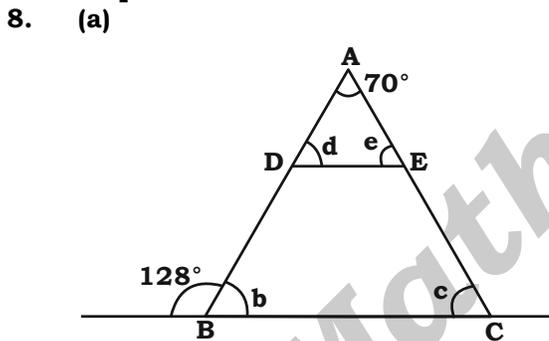
$$b = 71^\circ \text{ [Corresponding angles]}$$

$$\Rightarrow x = 180^\circ + 33^\circ - 71^\circ = 142^\circ$$

6. (b)  
From a single point to a line these is only one perpendicular

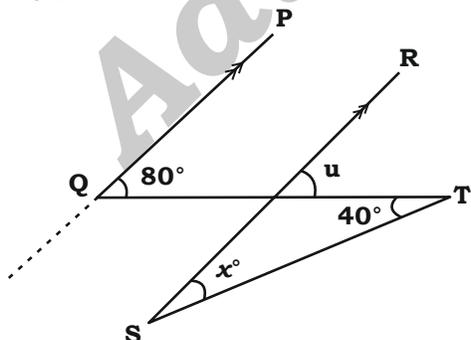


From figure:-  
 $r = 180^\circ - 125^\circ = 55^\circ$   
 $\Rightarrow q = 180^\circ - 45^\circ - 55^\circ = 80^\circ$

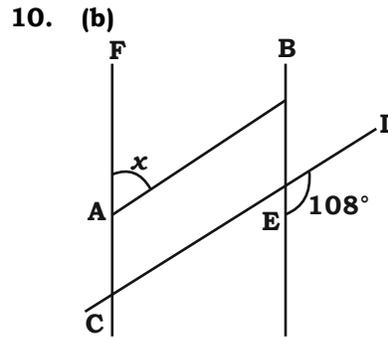


From figure:-  
 $\angle b = 180^\circ - 128^\circ$  (Linear angle)  $= 52^\circ$   
 $= [\because DE \parallel BC]$   
 Therefore  
 $\angle b = \angle d$   
 Then,  
 $\angle d = 52^\circ$   
 $\angle C = 180^\circ - 70^\circ - 52^\circ = 58^\circ$

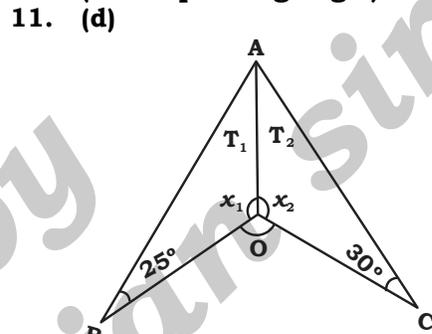
9. (a)  
PQ  $\parallel$  RS



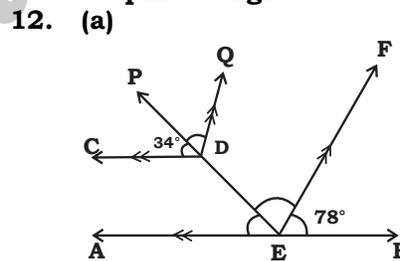
$u^\circ = 80^\circ$  (Corresponding angle)  
 Also,  $x^\circ + 40^\circ = 80^\circ$  (Exterior angle)  
 $x = 40^\circ$



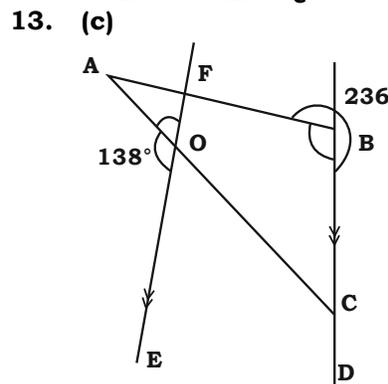
$\angle BED = 180^\circ - 108^\circ$  (Linear angle)  $= 72^\circ$   
 $= \angle FCD$  [Corresponding angle]  
 Also,  $\angle FCD = \angle FAB = 72^\circ = x$   
 (Corresponding angle)



$\because$  Sum of angles of a triangle  $= 180^\circ$   
 $\Rightarrow$  Sum of angles of  $T_1$  &  $T_2 = 360^\circ$   
 $\Rightarrow 65^\circ + 25^\circ + 30^\circ + x_1 + x_2 = 360^\circ$   
 $\Rightarrow x_1 + x_2 = 240^\circ$   
 Required angle  $= 360^\circ - 240^\circ = 120^\circ$



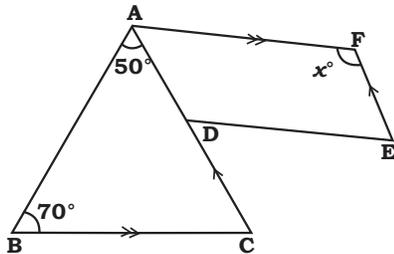
Since,  $CD \parallel AB$   
 $\angle PDC = \angle PEA$  [Corresponding angles]  $= 34^\circ$   
 $\Rightarrow \angle PEF = (180^\circ - 78^\circ - 34^\circ) = 68^\circ$   
 Also,  $DQ \parallel EF$   
 $\Rightarrow \angle DEF = \angle PDQ = 68^\circ$  [corresponding angles]



Extend EO upto F.

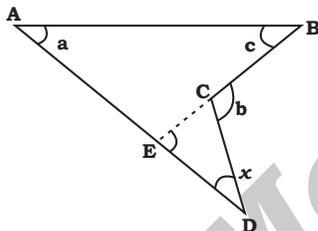
$\angle AOF = 180^\circ - 138^\circ = 42^\circ$   
 $\angle AFO = \angle FBC$   
 [Corresponding angles]  
 $\Rightarrow \angle AFO = \angle ABC = (360^\circ - 236^\circ) = 124^\circ$   
 $\therefore$  In  $\triangle OAF$ :-  
 $\theta = 180^\circ - 124^\circ - 42^\circ = 14^\circ$

14. (c)



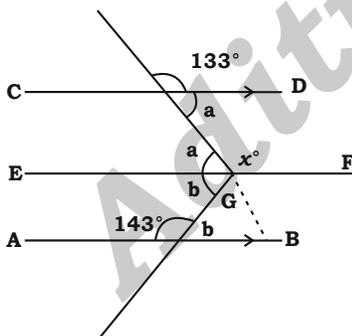
$\angle BCA = 180^\circ - 70^\circ - 50^\circ = 60^\circ$   
 (By angle sum prop.)  
 Since,  $BC \parallel AF$   
 $\Rightarrow \angle BCA = \angle FAC = 60^\circ$   
 [Alternate angles]  
 Also,  $AC \parallel FE$   
 $\Rightarrow \angle CAF + \angle AFE = 180^\circ$   
 [Interior angles]  
 $\Rightarrow x^\circ = 180^\circ - 60^\circ = 120^\circ$

15. (a)



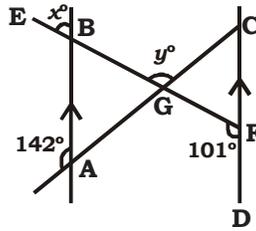
$\angle CED = a + c$  (Exterior angle)  
 In  $\triangle EDC$ :-  
 $x = 180^\circ - (180^\circ - b) - (a + c)$   
 $= b - a - c$

16. (d)



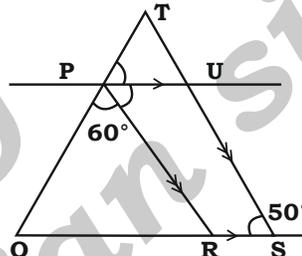
Draw a line  $EF \parallel CD \parallel AB$   
 Passing through G.  
 $\Rightarrow x = \angle a + \angle b$  .....(1)  
 $\angle a = 180^\circ - 133^\circ = 47^\circ$   
 $\angle b = 180^\circ - 143^\circ = 37^\circ$   
 $\Rightarrow x = 47^\circ + 37^\circ$  (from (1)) =  $84^\circ$

17. (a)



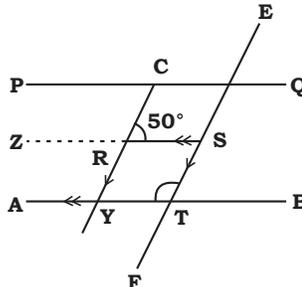
$\angle BAC = (180^\circ - 142^\circ) = 38^\circ$   
 given that  $AB \parallel DC$   
 Then  $\angle ACD = 38^\circ$   
 $\angle EFC = (180^\circ - 101^\circ) = 79^\circ$   
 A.T.Q,  
 $y$  is a exterior angle of  $\angle FGC$   
 Then  $\angle y = 79^\circ + 38^\circ = 117^\circ$   
 $\angle x = 79^\circ$

18. (b)



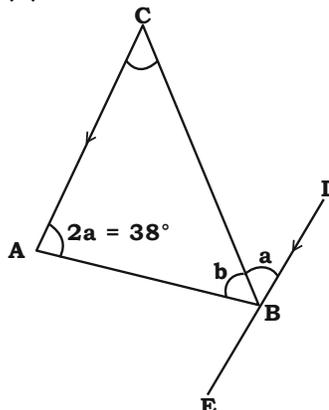
In figure, PUSR is a parallelogram  
 $\Rightarrow \angle UPR = 50^\circ$   
 $\Rightarrow \angle TPU = 180^\circ - 60^\circ - 50^\circ = 70^\circ$

19. (a)



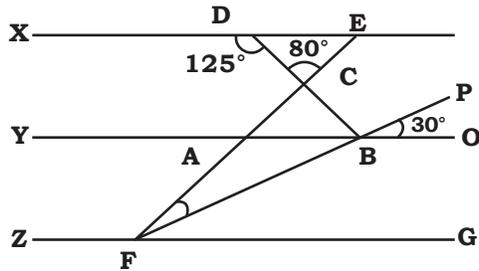
Extend CR and SR  
 $CY \parallel EF$  and  $ZS \parallel AB$   
 $\Rightarrow YRST$  is a parallelogram  
 $\Rightarrow 180^\circ - 50^\circ = \angle YTS = 130^\circ$

20. (c)



Clearly,  $a = 19^\circ$   
 $\angle ACB = \angle CBD$  [alternate angles]  $= 19^\circ$   
 $\Rightarrow \angle CBA = 180^\circ - 38^\circ - 19^\circ = 123^\circ$   
 $\Rightarrow b + 5a = 123^\circ + 95^\circ = 218^\circ$

21. (c)



$\angle CDE = 180^\circ - 125^\circ$  (Linear angle)  $= 55^\circ$   
 $\Rightarrow \angle DEC = 180^\circ - 55^\circ - 80^\circ = 45^\circ$   
 $= \angle EFG$   
 $\angle PFG = \angle PBO$  (Corresponding angles)  $= 30^\circ$   
 $\Rightarrow \angle EFP = 45^\circ - 30^\circ = 15^\circ$

22. (b)

60 sec  $\rightarrow$  15 revolutions

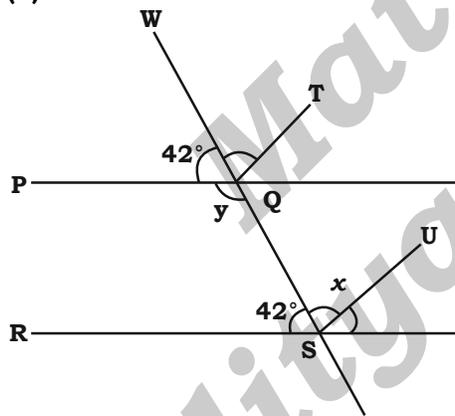
1 sec  $\rightarrow \frac{1}{4}$  revolutions

7 sec  $\rightarrow \frac{7}{4}$  revolutions

1 revolution  $= 2\pi$  angle

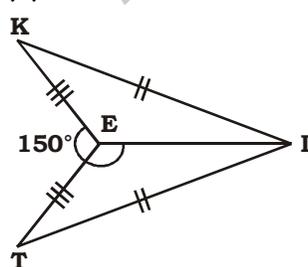
$\frac{7}{4}$  revolution  $= \frac{7}{2}\pi$  angle

23. (c)



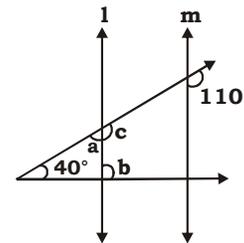
$y = 180^\circ - 42^\circ$  (Linear angle)  $= 138^\circ$   
 $\angle RSQ = 42^\circ$  (Corresponding  $\angle PQW$ )  
 Also,  $42^\circ + x + 68^\circ = 180^\circ$   
 $x = 180^\circ - 110^\circ = 70^\circ$   
 $\Rightarrow x + y = 138 + 70^\circ = 208^\circ$

24. (c)



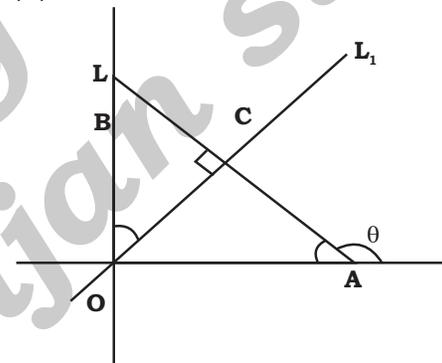
$\triangle KEI \cong \triangle TEI$   
 (By SSS)  
 $\Rightarrow \angle KEI = \angle IET = x$  (say)  
 $\Rightarrow 2x + 150^\circ = 360^\circ$  (complete angle)  
 $\Rightarrow x = 105^\circ$

25. (c)



since  $l \parallel m$   
 $\Rightarrow \angle C = 110^\circ$   
 $\Rightarrow \angle a = 180^\circ - 110^\circ$  [Linear angle]  
 $\angle b = 40^\circ + \angle a$  [Exterior angle]  
 $= 40^\circ + 70^\circ = 110^\circ$

26. (d)



$L \perp L_1 \Rightarrow \angle OCA = 90^\circ = \frac{\pi}{2}$

$\angle CAO = \pi - \theta$

In  $\triangle OAC$ :-

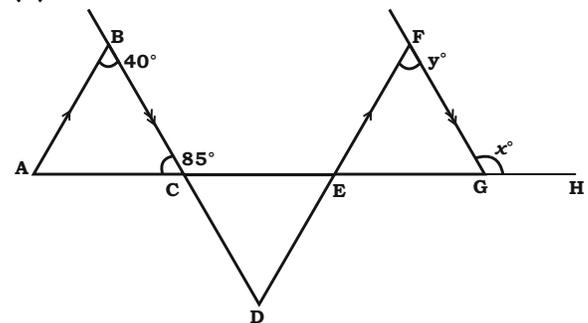
$\angle COA = \pi - \left[ \pi - \theta + \frac{\pi}{2} \right] = \theta - \frac{\pi}{2}$

$\Rightarrow \angle BOC = \frac{\pi}{2} - \angle COA$

$= \frac{\pi}{2} - \left[ \theta - \frac{\pi}{2} \right]$

$\frac{\pi}{2} - \theta + \frac{\pi}{2} = \pi - \theta$

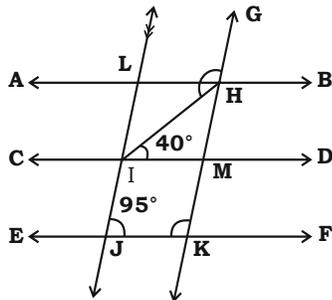
27. (c)



$AB \parallel EF$  and,  $BD \parallel FG$

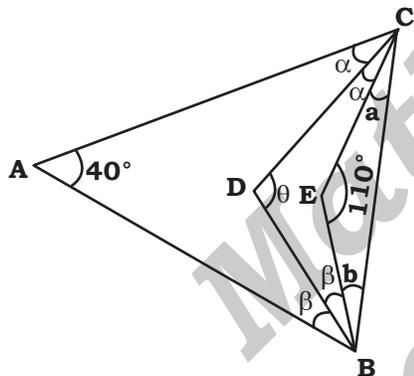
Clearly,  
 $\angle ABD = \angle EFG = y^\circ = 40^\circ$   
 Also,  
 $\angle BCA = \angle FGE = 85^\circ$   
 $\Rightarrow \angle FGH = x^\circ = 180^\circ - 85^\circ = 95^\circ$

28. (d)



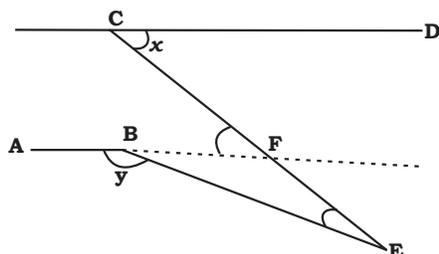
Extend lines GH and JI.  
 $\Rightarrow LJ \parallel GK$   
 $\angle IHL = \angle HID = 40^\circ$   
 [Alternate Interior angles]  
 $\Rightarrow \angle MKJ = 180^\circ - 95^\circ = 85^\circ$   
 and,  
 $\angle LHG = \angle JKM = 85^\circ$   
 [Corresponding angles]  
 $\Rightarrow \angle GHI = 85^\circ + 40^\circ = 125^\circ$

29. (c)



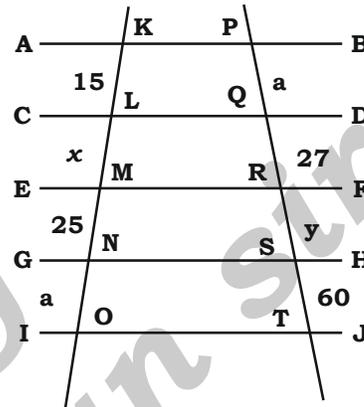
Join BC to form a triangle ABC  
 Let,  $\angle EBC = b$ , and  $\angle ECB = a$   
 In  $\triangle CEB$ :-  
 $\Rightarrow a + b = 180^\circ - 110^\circ = 70^\circ \dots\dots(1)$   
 Also, In  $\triangle CAB$ :-  
 $40^\circ + 2\alpha + 2\beta + b + a = 180^\circ$   
 $\Rightarrow \alpha + \beta = 35^\circ \dots\dots(2)$   
 Now, In  $\triangle BDC$ :-  
 $\beta + b + \alpha + a + \theta = 180^\circ$   
 $\Rightarrow 35^\circ + 70^\circ + \theta = 180^\circ$  [from (1) and (2)]  
 $\Rightarrow \theta = 75^\circ$

30. (d)



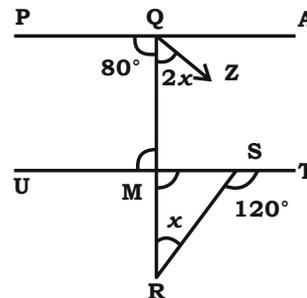
Extend AB upto F.  $AF \parallel CD$   
 $\angle FBE = 180^\circ - y$   
 $\angle BFE = -\angle CFB + 180^\circ$   
 $= 180^\circ - \angle FCD$   
 [Alternate angles]  
 In  $\triangle BFE$  :-  
 $\angle BEF = 180^\circ - (180^\circ - y + 180^\circ - x)$   
 $= x + y - 180^\circ$   
 $= x + y - \pi$

31. (b)



In the figure:-  
 $\frac{KL}{PQ} = \frac{LM}{QR} = \frac{MN}{RS} = \frac{NO}{ST}$   
 $\Rightarrow \frac{15}{a} = \frac{x}{27} = \frac{25}{y} = \frac{a}{60}$   
 $\therefore \frac{15}{a} = \frac{a}{60}$   
 $\Rightarrow a = 30 \text{ cm}$   
 $\Rightarrow \frac{x}{27} = \frac{1}{2} \Rightarrow x = \frac{27}{2}$   
 and  $y = 50$   
 $\Rightarrow x + y = \frac{127}{2} = 63.5 \text{ cm}$

32. (c)



$PQ \parallel ST \Rightarrow PA \parallel UT$   
 $\angle PQM + \angle UMQ = 180^\circ$   
 [Interior angles]  
 $\Rightarrow \angle UMQ = 100^\circ = \angle RMS$

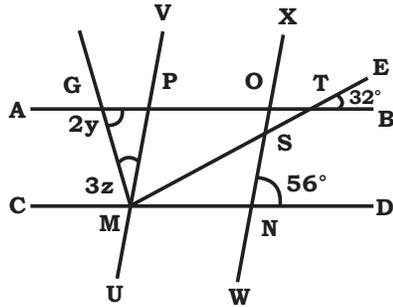
[Vertically opp. angles]

In  $\Delta MRS$ :-

$$x + 100^\circ = 120 \text{ [Exterior angle]}$$

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

33. (a)



$AB \parallel CD$

ATQ,

$$\text{In } \Delta MSN = 3x + 32 + 124 = 180^\circ$$

$$3x = 180 - 156$$

$$3x = 24 \Rightarrow x = 8^\circ$$

According to figure

MNOP is a parallelogram

Then,

$$2y^\circ + 3z^\circ + 24^\circ + 32^\circ = 180^\circ$$

given that  $\angle GMT = 90^\circ$

Then,

$$2y^\circ + 90^\circ + 32^\circ + 180^\circ$$

$$2y = 180^\circ - 122^\circ$$

$$2y = 58^\circ$$

In  $\Delta MGP$

$$= 2y^\circ + 3z^\circ = 124^\circ$$

$$58^\circ + 3z^\circ = 124^\circ$$

$$3z^\circ = 66^\circ \Rightarrow z = 22^\circ$$

Then,

$$\frac{x^\circ + 2y^\circ + z^\circ}{8} = \frac{8^\circ + 58^\circ + 22^\circ}{8} = 11^\circ$$

34. (b)

Complementary angles of

$$30^\circ 20' = 90^\circ - 30^\circ 20'$$

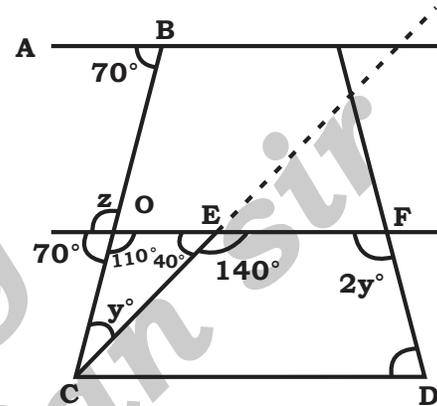
$$= 90^\circ - (30^\circ + 20')$$

$$= 89^\circ - 30^\circ + 60' - 20'$$

$$= 59^\circ + 40'$$

$$= 59^\circ 40'$$

35. (d)



$\angle ABC = \angle BCD$  (alternate angles)

Also,  $\angle z = 180^\circ - 70^\circ = 110^\circ$  (interior angles)

$= \angle COE$

In  $\Delta COE$ :-

$$y = 180^\circ - 110^\circ - (180^\circ - 140^\circ) = 30^\circ$$

In Quadrilateral CDFO:-

$$110^\circ + (2 \times 30^\circ) + x + 70^\circ = 360^\circ$$

$$\Rightarrow x = 120^\circ$$