



## MATHS

### BOOKS - S CHAND IIT JEE FOUNDATION

#### LINES AND ANGLES

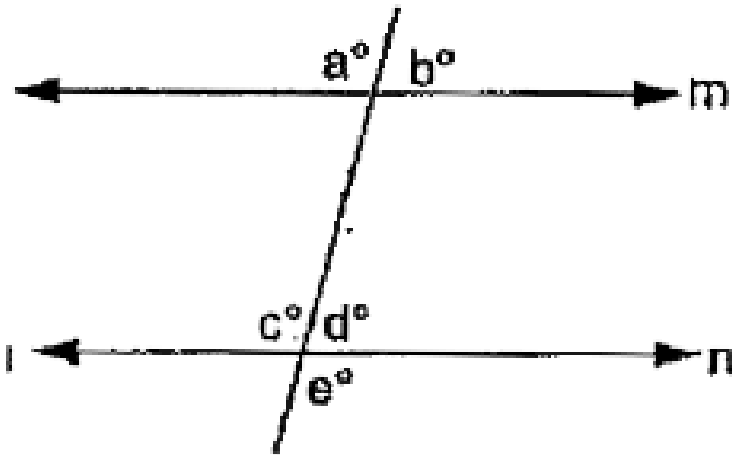
##### Solved Examples

1. In Figure, two straight lines  $PQ$  and  $RS$  intersect each other at  $O$ . If  $\angle POT = 75^\circ$ , find the values of  $a$ ,  $b$  and  $c$

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2. In the given figure , lines  $m$  and  $n$  are not parallel and will intersect at some point to the right of the page Which of the following statements is / are true ?

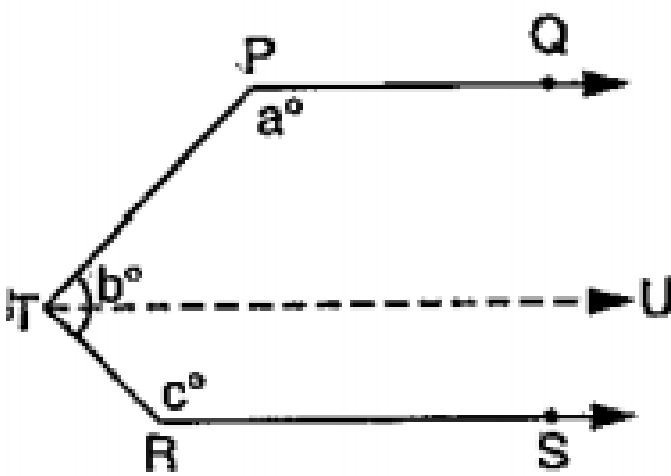
(I)  $c = e$  (II)  $b > d$  (III)  $a = c$



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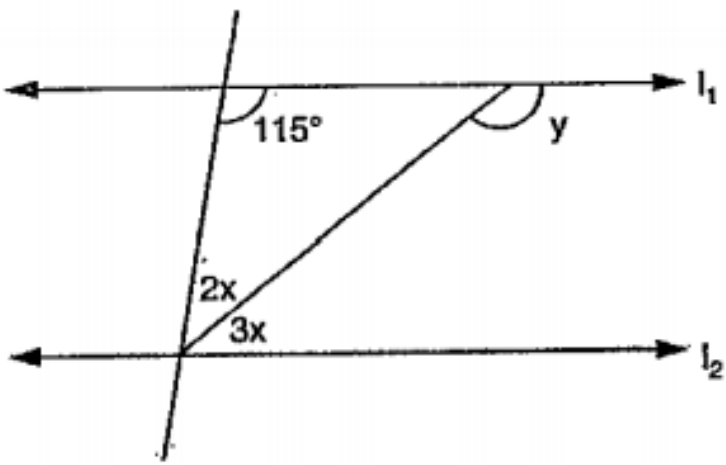
3. If ray  $PQ$  and  $Rs$  are parallel as given in the figure , then

find  $a$   $+b+c$  .



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4. If line  $l_1$  is parallel to line  $l_2$  in the given figure , what is the value of  $y$  ?



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## Questions Bank

1. How many degrees are there in an angle which equals one - fifth of its supplement ?

A.  $15^\circ$

B.  $30^\circ$

C.  $75^\circ$

D.  $150^\circ$

**Answer: B**



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2. Two complementary angles are such that two times the measure of one is equal to three times the measure of the other .the measure of the larger angle is :

A.  $72^\circ$

B.  $108^\circ$

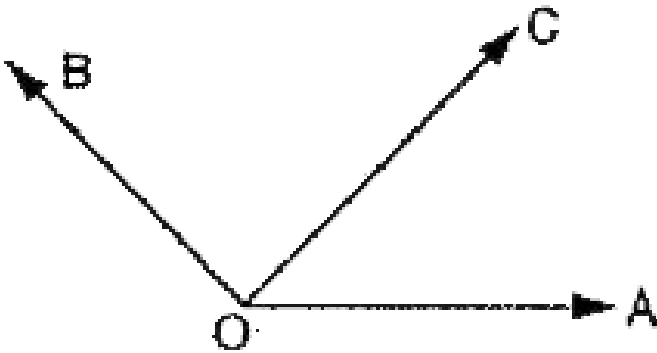
C.  $36^\circ$

D.  $54^\circ$

Answer: D

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3. In the given figure, if  $\angle BOC = 7x + 20^\circ$  and  $\angle COA = 3x$ , then the value of  $x$  for which AOB becomes a straight line is :



A.  $16^\circ$

B.  $14^\circ$

C.  $20^\circ$

D.  $21^\circ$

**Answer: A**

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4.  $LM$  is a straight line and  $O$  is a point on  $LM$ . Line  $ON$  is drawn not coinciding with  $OL$  or  $OM$ . If  $\angle MON$  is three times  $\angle LON$ , then  $\angle MON$  is equal to :

A.  $45^\circ$

B.  $60^\circ$

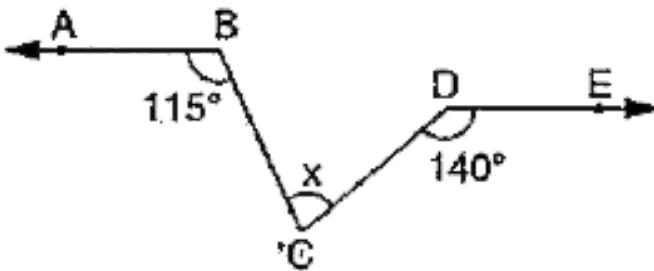
C.  $105^\circ$

D.  $135^\circ$

Answer: D

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5. Given that  $AB \parallel DE$ ,  $\angle ABC = 115^\circ$ ,  $\angle EDC = 140^\circ$ , then the value of  $x$  is :



A.  $45^\circ$

B.  $55^\circ$

C.  $65^\circ$

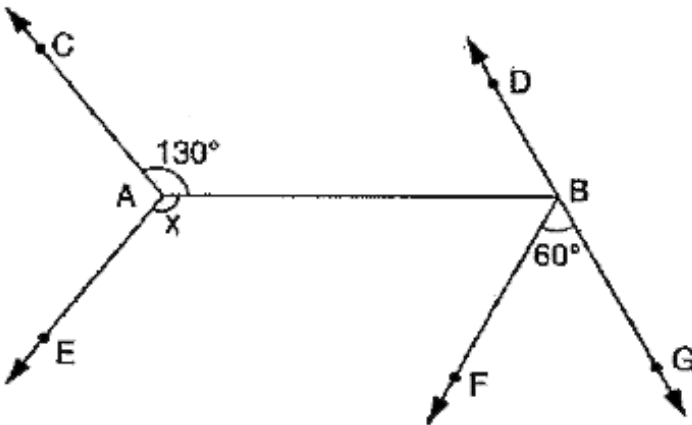


D.  $75^\circ$

Answer: D

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6. In the given figure  $AC \parallel BD$ , and  $AE \parallel BF$ . The measure of  $\angle x$  is



A.  $130^\circ$

B.  $110^\circ$

C.  $70^\circ$

D.  $50^\circ$

**Answer: B**

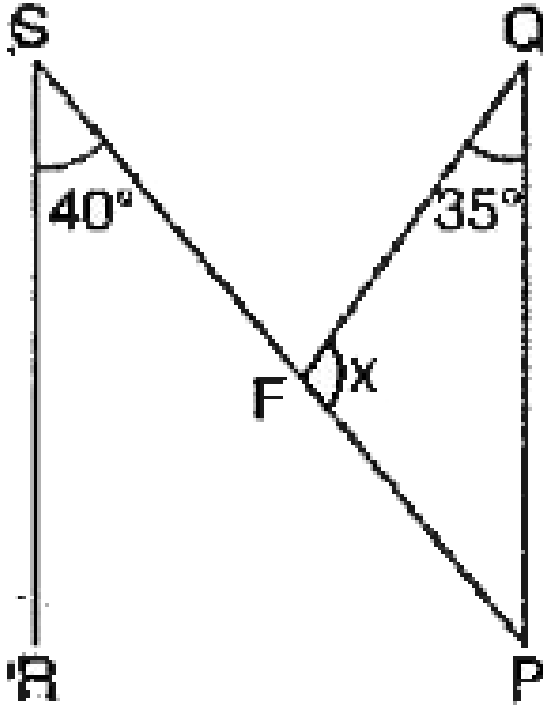


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7. In the given figure

$PQ \parallel RS$ ,  $\angle RSF = 40^\circ$ ,  $\angle PQF = 35^\circ$  and  $\angle QFP = x^\circ$

. What is the values of  $x$  ?

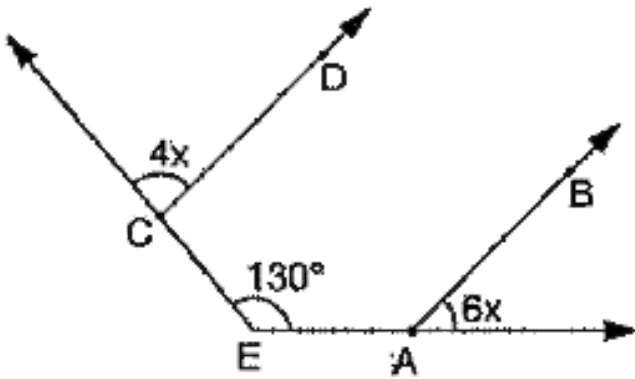


- A.  $75^\circ$
- B.  $105^\circ$
- C.  $135^\circ$
- D.  $140^\circ$

Answer: B

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8. In the given figure,  $AB \parallel CD$ . Find  $x$ .



A.  $26^\circ$

B.  $13^\circ$

C.  $23^\circ$

D.  $46^\circ$

**Answer: B**

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9. A and B are two points and C is any point collinear with A and B. If  $AB=10$ ,  $BC=5$ , then AC is equal to :

- A. either 15 or 5
- B. necessarily 5
- C. necessarily 16
- D. none of these

**Answer: A**

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10. Three lines intersect at a point generating six angles . If one of these angles is  $90^\circ$  , then the number of other distinct angles is :

A. 1 or 2

B. 1 or 3

C. 2 or 3

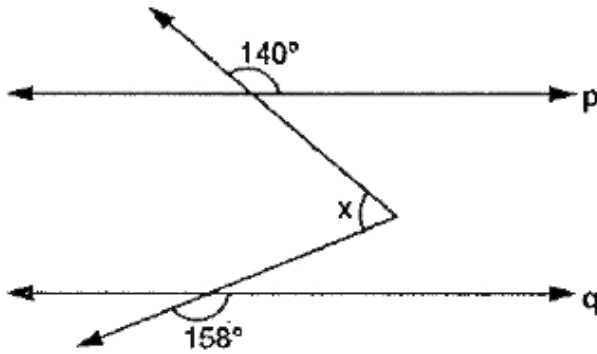
D. 2 or 4

**Answer: A**



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11. Assume  $p \parallel q$  in the figure shown .then 'x' equals



- A.  $18^\circ$
- B.  $22^\circ$
- C.  $62^\circ$
- D. cannot be determined

**Answer: C**

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12. If X,Y and Z are three points such that  $XY = 2YZ$  and  $XZ = 3YZ$ , then the three points are :

- A. not collinear
- B. collinear and X lies between Y and Z
- C. collinear and Y lies between X and Z
- D. collinear and Z lies between X and Y

**Answer: C**



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13. If the arms of one angle are respectively parallel to the arms of another angle, then the two angles are :



A. neither equal nor supplementary

B. not equal but supplementary

C. equal but not supplementary

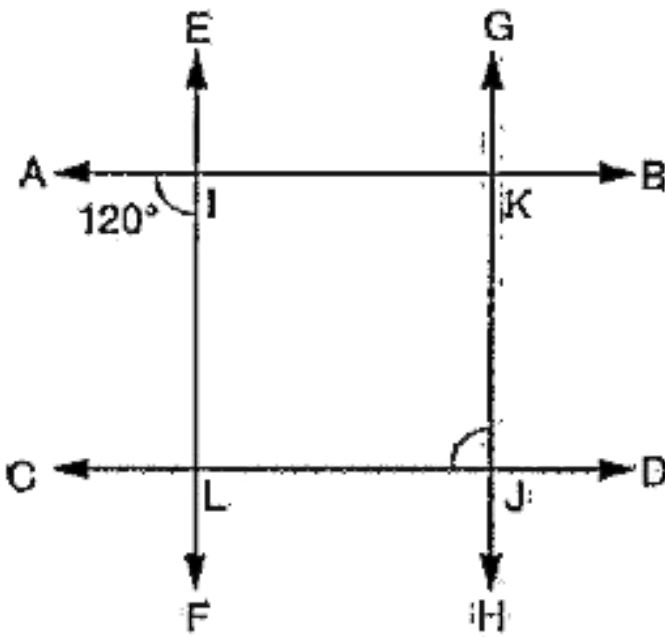
D. either equal or supplementary

**Answer: D**



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14. In the given figure  $AB \parallel CD$  and  $EF \parallel GH$ . If  $\angle AIF = 120^\circ$ , then  $\angle CJG$  is

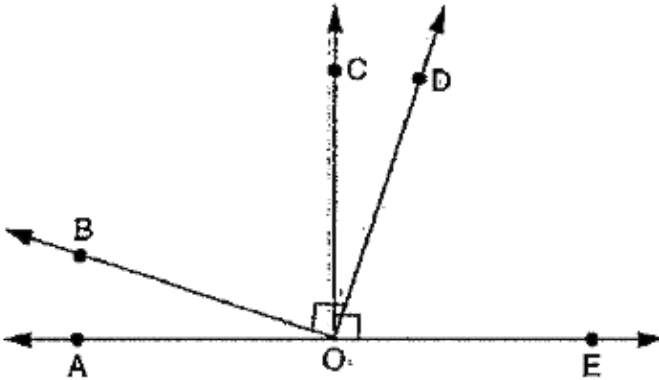


- A.  $80^\circ$
- B.  $100^\circ$
- C.  $\frac{1}{3}$  of a right angle
- D.  $\frac{2}{3}$  of a right angle

**Answer: D**

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15. In the given figure ,  $\angle COE$  and  $\angle BOD$  are right angles .If the measure of  $\angle BOC$  is four times the measure of  $\angle COD$  , what is the measure of  $\angle AOB$  ?



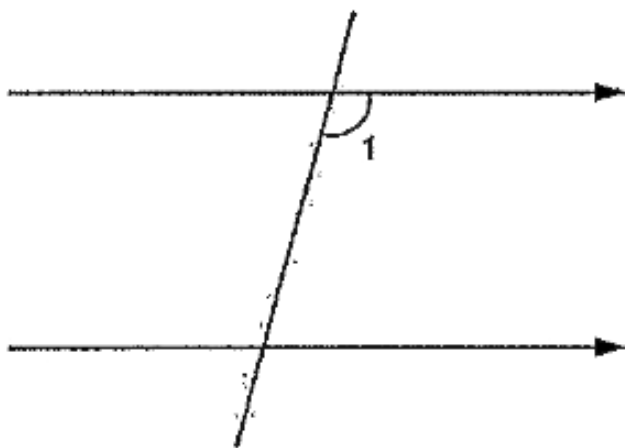
- A.  $16^\circ$
- B.  $17^\circ$
- C.  $18^\circ$
- D.  $19^\circ$

**Answer: C**



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16. For two parallel lines and a transversal ,  $\angle 1 = 74^\circ$ . For which pair of angle measures is the sum the least ?



- A.  $\angle 1$  and a corresponding angle
- B.  $\angle 1$  and the corresponding co - interior angle
- C.  $\angle 1$  and its supplement
- D.  $\angle 1$  and its complement

**Answer: D**



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**17.** Lines  $m$  and  $n$  are cut by a transversal , so that  $\angle 1$  and  $\angle 5$  are corresponding angles.If  $\angle 1 = 26x - 7^\circ$  and  $\angle 5 = 20x + 17^\circ$  .What value of  $x$  makes the lines  $m$  and  $n$  parallel ?

A. 5

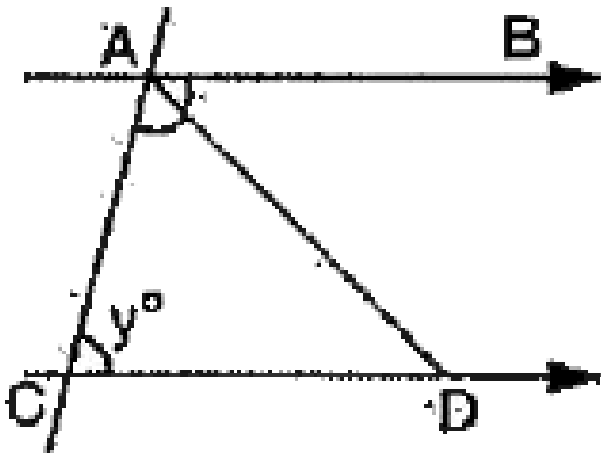
B. 4

C.  $4\frac{1}{2}$

D.  $3\frac{1}{4}$

**Answer: B**

18. In the given figure , ray  $AD$  is the bisector of  $\angle CAB$  and the measure of  $\angle ACD$  is  $y$  .What must be the measure of  $\angle ADC$  in order for line  $AB$  to be parallel to line  $CD$  .



- A.  $90^\circ - y$
- B.  $90^\circ - y/2$
- C.  $180^\circ - y/2$

D.  $90^\circ + y$

**Answer: B**

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19. AB is a straight line and O is a point lying on AB. A line OC is drawn from O such that  $\angle COA = 36^\circ$ . OD is a line within  $\angle COA$  such that  $\angle DOA = \frac{1}{3} \angle COA$ . If OE is a line within the  $\angle BOC$ ,  $\angle BOE = \frac{1}{4} \angle BOC$ , then  $\angle DOE$  must be

A.  $60^\circ$

B.  $132^\circ$

C.  $144^\circ$

D.  $108^\circ$

**Answer: B**

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20. The straight lines  $AB$  and  $CD$  intersect at  $E$ . If  $EF$  and  $EG$  are bisectors of  $\angle DEA$  and  $\angle AEC$  respectively and if  $\angle AEF = x$  and  $\angle AEG = y$ , then

A.  $x + y > 90^\circ$

B.  $x + y < 90^\circ$

C.  $x + y = 90^\circ$

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

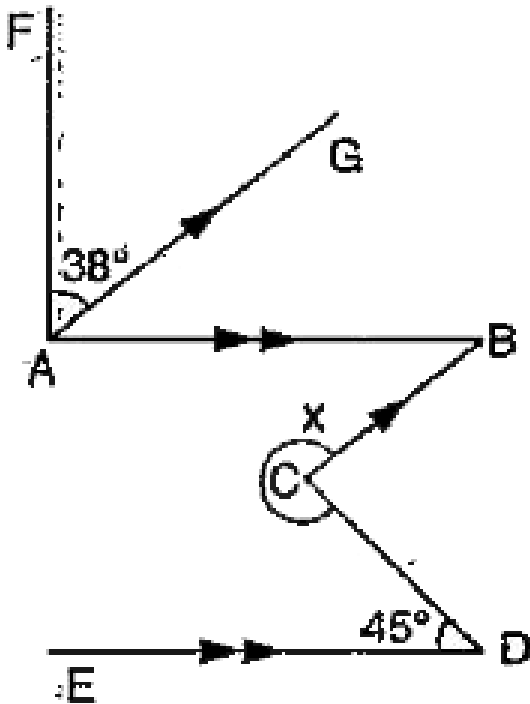


Answer: C

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21. Given ,  $AB \parallel ED$ ,  $AG \parallel CB$  and  $AF \perp AB$ .

$\angle FAG = 38^\circ$ ,  $\angle CDE = 45^\circ$ . Find the value of  $x$ .



A.  $263^\circ$

B.  $277^\circ$

C.  $289^\circ$

D.  $308^\circ$

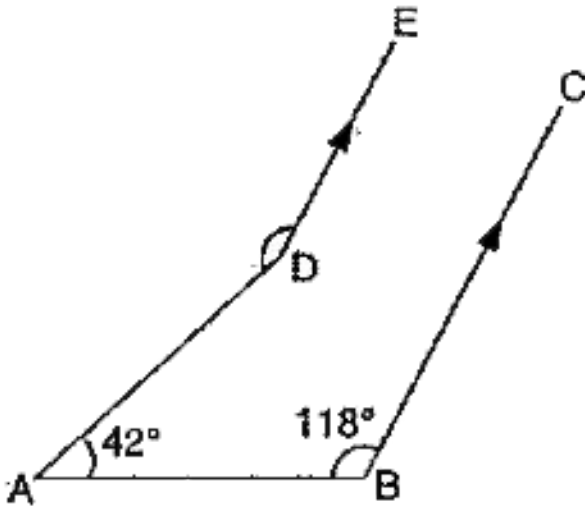
**Answer: A**



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22. In the given figure ,  
 $DE \parallel BC$ ,  $\angle ABC = 118^\circ$ ,  $\angle DAB = 42^\circ$  , then

$\angle ADE$  is equal to :



A.  $118^\circ$

B.  $42^\circ$

C.  $138^\circ$

D.  $160^\circ$

**Answer: D**



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1. The bisector of an angle is produced backwards .It bisects which angle at the same vertex ?

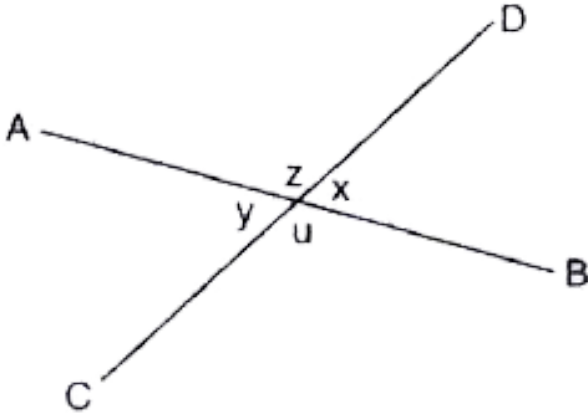
- A. acute
- B. obtuse
- C. reflex
- D. complete

**Answer: C**



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2. If  $x + z + y = 240^\circ$ , find the value of each of the four angles in the order  $x, y, z, u$ .



- A.  $50^\circ, 50^\circ, 130^\circ, 130^\circ$
- B.  $60^\circ, 60^\circ, 120^\circ, 120^\circ$
- C.  $60^\circ, 70^\circ, 110^\circ, 120^\circ$
- D.  $50^\circ, 60^\circ, 130^\circ, 120^\circ$

**Answer: B**



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3. Find the complement of an angle whose measure is  $3x - 8^\circ$ .

A.  $3x - 98^\circ$

B.  $82^\circ - 3x$

C.  $98^\circ - 3x$

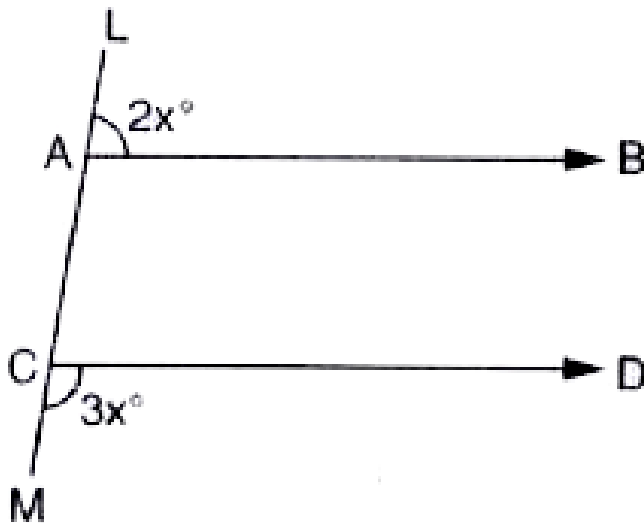
D.  $3x - 82^\circ$

**Answer: C**



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4.  $AB \parallel CD$  and  $ACM$  is a straight line  $\angle BAC$  is equal to



A.  $106^\circ$

B.  $108^\circ$

C.  $110^\circ$

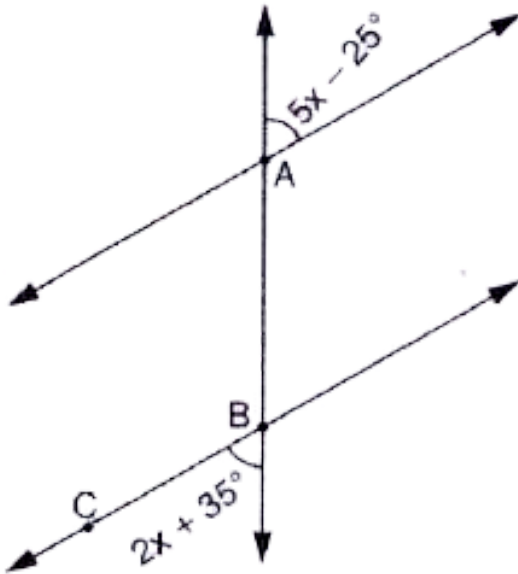
D.  $109^\circ$

**Answer: B**



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5.  $\angle ABC$  is equal to



- A.  $75^\circ$
- B.  $105^\circ$
- C.  $115^\circ$
- D.  $85^\circ$



**Answer: B**



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**6.** Two lines in a plane are cut by a transversal .Which condition does NOT imply that the two lines are parallel ?

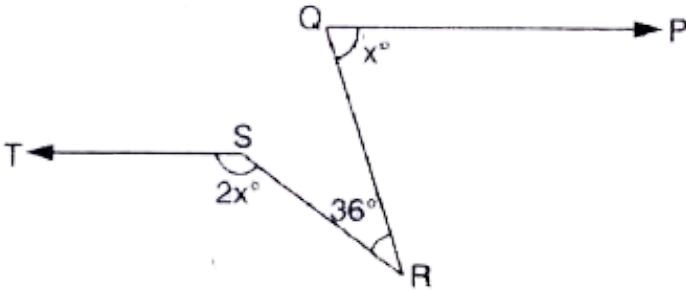
- A. A pair of alternate interior angles are congruent .
- B. A pair of co- interior angles are supplementary .
- C. A pair of corresponding angles are congruent .
- D. A pair of alternate exterior angles are complementary

**Answer: D**



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7.  $QP \parallel TS$  and  $\angle QRS = 36^\circ$ . Calculate  $\angle PQR$ .



A.  $75^\circ$

B.  $70^\circ$

C.  $72^\circ$

D.  $71^\circ$

Answer: C



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8. Draw four lines  $OA,OB,OC,OD$  in order ,  
 $\angle AOB = 48^\circ$ ,  $\angle COD = 34^\circ$  .  $OP$  bisects  $\angle AOB$  ,  $OQ$   
bisects  $\angle COD$  . If  $OQ$  is perpendicular to  $OP$ , calculate  
 $\angle BOC$  .

A.  $49^\circ$

B.  $50^\circ$

C.  $51^\circ$

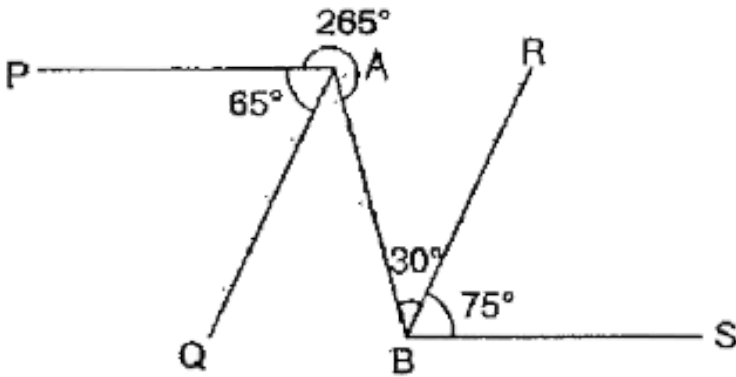
D.  $48^\circ$

**Answer: A**



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9. State , with reasons , which lines are parallel .



A. AP,BS

B. AQ,RB

C. AP,RB

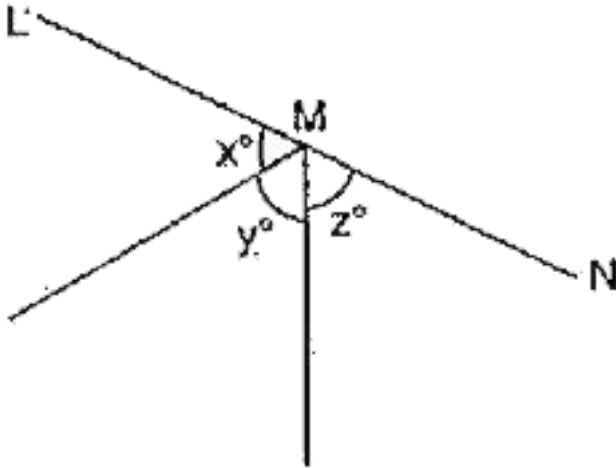
D. Cannot be determined

**Answer: B**



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10. Find  $y$  if  $x+z=y$



- A.  $80^\circ$
- B.  $100^\circ$
- C.  $90^\circ$
- D.  $110^\circ$

**Answer: C**

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