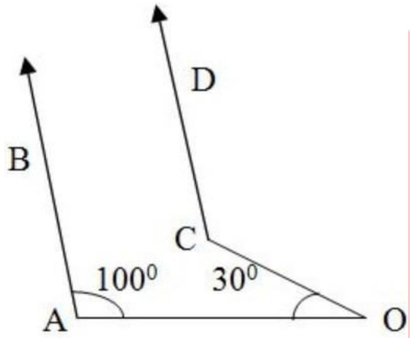
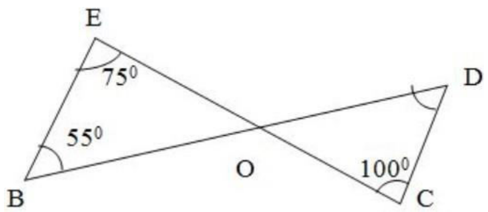
CBSE Test Paper 02

CH-6 Lines and Angles

1. The number of angles formed by a transversal with a pair of parallel lines are
   a. 8
   b. 4
   c. 6
   d. 3
2. In the given figure, AB $\parallel$ CD. If $\angle$AOC = 30° and $\angle$OAB = 100°. then $\angle$OCD =?



   a. 80°
   b. 100°
   c. 130°
   d. 150°
3. If two angles are supplementary and the larger is 20^0 less then three times the smaller, then the angles are :-
   a. $72\frac{1}{2}^0, 17\frac{1}{2}^0$
   b. $140^0, 40^0$
   c. $130^0, 50^0$
   d. $62\frac{1}{2}^0, 27\frac{1}{2}^0$
4. In the given figure, $\angle$OEB = 75°, $\angle$OBE = 55° and $\angle$OCD = 100°. Then $\angle$ODC = ?



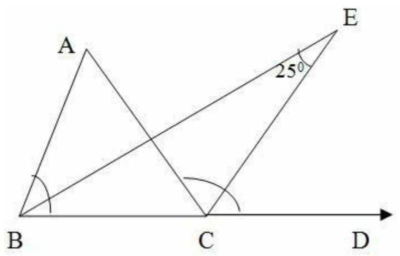
a. 30°

b. 25°

c. 35°

d. 20°

5. In the adjoining figure, BE and CE are bisectors of $\angle$ABC and $\angle$ACD respectively. If $\angle$BEC = 25°, then $\angle$BAC is equal to :-



a. 50°

b. $25\frac{1}{2}\ ^0$

c. 65°

d. $12\frac{1}{2}\ ^0$

6. Fill in the blanks:

A line segment has_________end points.

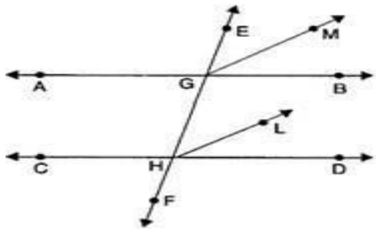
7. Fill in the blanks:

A line has_________end point.

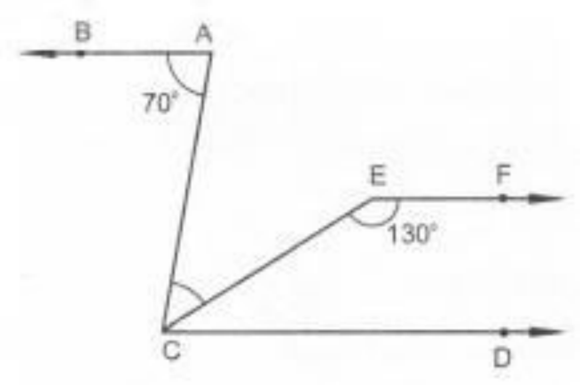
8. An angle is equal to five times its complement. Determine its measure.

9. Two supplementary angles are in the ratio 2 : 3. Find the angles.

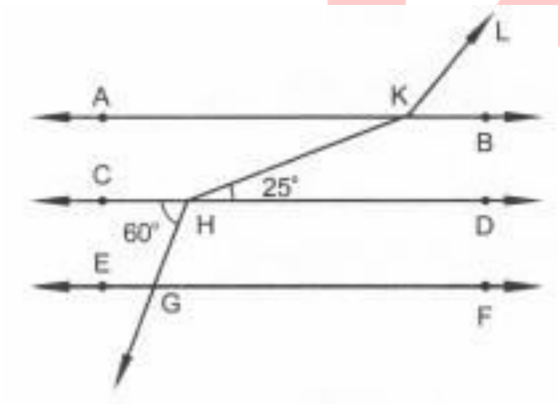
10. If two lines are intersected by a transversal in such a way that the bisectors of a pair of corresponding angles are parallel, then prove that lines are parallel.



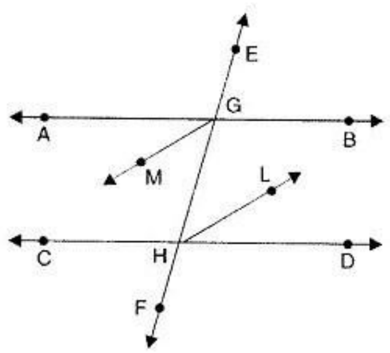
11. In Figure, if AB II CD and CD II EF, find ∠ACE.



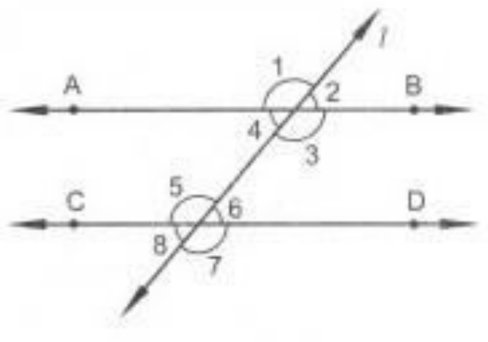
12. In figure, AB || CD || EF and GH || KL. Find ∠HKL.



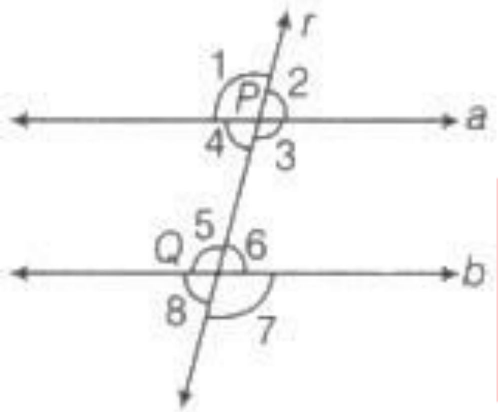
13. If two parallel lines are intersected by a transversal, then prove that the bisectors of any two alternate angles are parallel.



14. In Fig., AB || CD and $\angle 1$ and $\angle 2$ are in the ratio 3 : 2. Determine all angles from 1 to 8.



15. In the given figure, if $\angle 2 = 120°$ and $\angle 5 = 60°$, then show that a $\parallel$ b.



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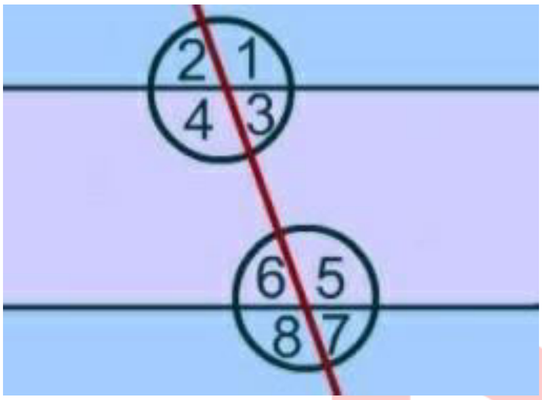
Solution

1. (a) 8

   Explanation:

   As we can see there are 4 angles formed at every point of intersection thus giving a total of 8 angles.

2. (c) 130°

   Explanation:

   Extend line CD which intersect AO at M.
   $\angle CMO = \angle BAO = 100°$ (Corresponding angle)
   In $\triangle MOC$
   $\angle MOC + \angle CMO = \angle DCO$ (exterior angle is equal to the sum of two opposite interior angles)
   $\angle DCO = 100° + 30° = 130°$

3. (c) 130^0, 50^0 Explanation:

   Let the two supplimentary angles be x^0 and $180^0 - x^0$

   Let 180^0 - x be the larger angle

   $180^0 - x = 3x - 20^0$

   $4x = 200^0$

$x = 50^0$

So the angles are 50^0 and 130^0

4. (a) 30°

   Explanation:

   In $\triangle$ OEB

   $\angle OEB + \angle EBO + \angle BOE = 180°$ (Angle sum property)

   $75° + 55° + \angle BOE = 180°$

   $\angle BOE = 50°$

   $\angle BOE = \angle COD = 50°$ (Vertically opposite angle)

   In $\triangle$ ODC

   $\angle ODC + \angle DOC + \angle DCO = 180°$

   $\angle ODC = 180° - 100° - 50°$

   $\angle ODC = 30°$

5. (a) 50°

   Explanation:

   In $\triangle BEC$

   $\angle BEC + \quad EBC = \angle ECD$ (Exterior angle property)

   $\angle BEC = \quad ECD - \angle EBC$

   In $\triangle ABC$

   $\angle ABC + \quad BAC = \quad ACD$

   $\angle ABC + 2\angle EBC = 2\angle ECD$

   $\angle ABC = 2(\angle ECD - \angle EBC)$

   $\angle ABC = 2(\angle BEC)$

   $\angle ABC = 50°$

6. two

7. no

8. Let the measure of the given angle be x degrees. Then, the measure of its complement is $(90 - x)°$.

It is given that:

Angle = 5 $\times$ Its complement

$\Rightarrow$ x = 5(90 - x)

$\Rightarrow$ x = 450 - 5x $\Rightarrow$ 6x = 450 $\Rightarrow$ x = 75

Thus, the measure of the given angle is 75°

9. Let the two angles be 2x and 3x in degrees. Then,

   $\therefore$ 2x + 3x = 180

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

   Thus, the measures of two angles are 2x = 2 $\times$ 36° = 72° and 3x = 3 $\times$ 36° = 108°.

10. GM || HL ...... [Given]

    $\therefore$ $\angle$EGM = $\angle$GHL .... [Corresponding angles]

    $\therefore$ 2$\angle$EGM = 2$\angle$GHL

    $\therefore$ $\angle$EGB = $\angle$GHD . . . [GM bisects the $\angle$EGB and HL bisects the $\angle$GHD]

    These angles form a pair of equal corresponding angles for lines AB and CD and transversal EF.

    $\therefore$ AB || CD

11. Since EF || CD

    $\therefore$ $\angle$FEC + $\angle$ECD = 180° [co-interior angles are supplementary]

    $\Rightarrow$ $\angle$ECD = 180° - 130° = 50°

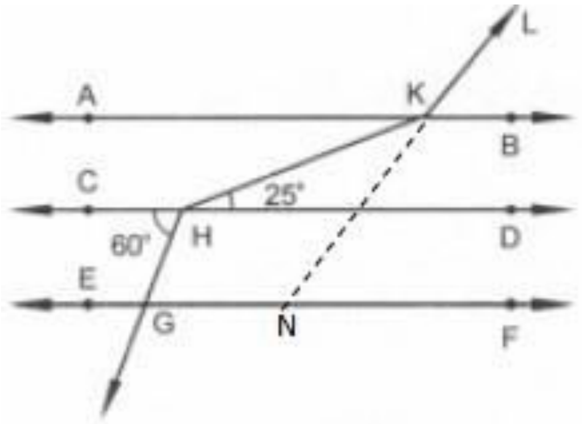
    Also BA || CD

    $\Rightarrow$ $\angle$BAC = $\angle$ACD = 70° [alternate interior angles]

    But $\angle$ACE + $\angle$ECD = $\angle$ACD = 70°

    $\Rightarrow$ $\angle$ACE = 70° - 50° = 20°

12.



Produce LK to meet GF at N.

Now,

$\angle CHG = \angle HGN = 60^o$ [alternate angles]

$\angle HGN = \angle KNF = 60^o$ [corresponding angles]

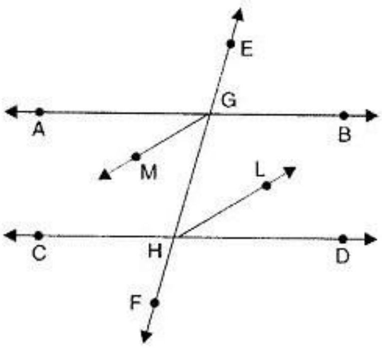
$\therefore \angle KNG = 180^o - 60^o = 120^o$ [linear pair]

$\angle GNK = \angle AKL = 120^o$ [corresponding angles]

$\angle AKH = \angle KHD = 25^o$ [alternate angles]

$\therefore \angle HKL = \angle AKH + \angle AKL = 25^o + 120^o = 145^o$

13.

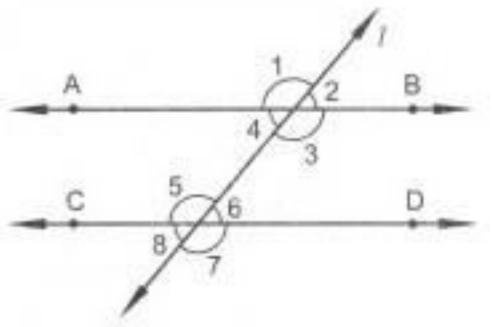


AB || CD and a transversal EF intersects them

$\therefore \angle AGH = \angle GHD$

$\frac{1}{2} \angle AGH = \frac{1}{2} \angle GHD$

$\angle MGH =$ GHL……. [As GM bisects the $\angle AGH$ and HL bisects the $\angle GHD$]

14. 

Given In Fig., AB || CD and $\angle 1$ and $\angle 2$ are in the ratio 3 : 2.

To find: All angles from 1 to 8.

Solution: Let $\angle 1 = 3x$, $\angle 2 = 2x$ [Given]

Now, $\angle 1 + \angle 2 = 180^o$ [linear pair]

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

$\Rightarrow 5x = 180^o$

$\Rightarrow x = 36^o$

$\therefore \angle 1 = 3x = 108^o$ and $\angle 2 = 2x = 72^o$

$\angle 1 = \angle 3 = 108^o$ [vertically opposite angles]

$\angle 2 = \angle 4 = 72^o$ [vertically opposite angles]

$\angle 1 = \angle 5 = 108^o$ [corresponding angles]

$\angle 2 = \angle 6 = 72^o$ [corresponding angles]

$\angle 5 = \angle 7 = 108^o$ [vertically opposite angles]

$\angle 6 = \angle 8 = 72^o$ [vertically opposite angles]

Hence, $\angle 1 = \angle 3 = \angle 5 = \angle 7 = 108^o$ and

$\angle 2 = \angle 4 = \angle 6 = \angle 8 = 72^o$

15. Given, $\angle 2 = 120^o$ and $\angle 5 = 60^o$

Also, transversal r intersects two lines a and b at P and Q, respectively.

Here, $\angle 2 = \angle 4$ [vertically opposite angles]

$\therefore \angle 4 = \angle 2 = 120^o$

Now, $\angle 4 + \angle 5 = 120^o + 60^o \Rightarrow \angle 4 + \angle 5 = 180^o$

So, $\angle 4$ and $\angle 5$ are supplementary angles.

Since, a is a straight line.

$\therefore \angle 4 + \angle 3 = 180^o$ [by linear pair axiom]

$\Rightarrow 120^o + \angle 3 = 180^o$

$\Rightarrow \angle 3 = 180^o - 120^o = 60^o$

Now, $\angle 7 = \angle 5 = 60^o$ [vertically opposite angles]

Here, $\angle 7 + \angle 8 = 180^o$ [by linear pair axiom]

$\therefore 60^o + \angle 8 = 180^o$

$\Rightarrow \angle 8 = 180^o - 60^o = 120^o$

$\because \angle 6 = \angle 8 = 120^o$ [vertically opposite angles]

$\therefore \angle 3 + \angle 6 = 60^o + 120^o = 180^o$

So, $\angle 3$ and $\angle 6$ are supplementary angles.

Thus, transversal r intersects lines a and b such that pair of interior angles on the same side of the transversal is supplementary. Hence, lines a and b are parallel.

Hence proved.