CBSE Test Paper 01

CH-6 Lines and Angles

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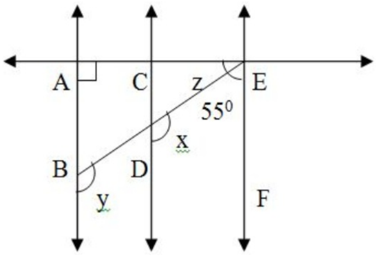
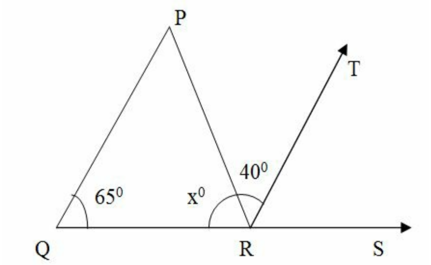
1. In the adjoining figure, AB || CD and AB || EF. If EA ⊥ BA and ∠BEF = 55°, then the values of x, y and z :-



   a. 125°, 125°, 35°
   b. 60°, 60°, 60°
   c. 120°, 130°, 25°
   d. 35°, 125°, 120°

2. If one angle of a triangle is equal to the sum of the other two angles, then the triangle is :
   a. an isosceles triangle
   b. an equilateral triangle
   c. a right triangle
   d. an obtuse angled triangle

3. In the adjoining figure, if QP || RT, then x is equal to –

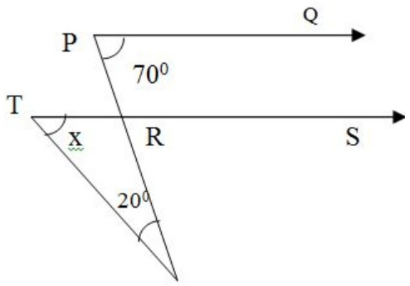


   a. 55°
   b. 75°
   c. 65°
   d. 70°

4. The number of lines that can pass through a given point is:
   a. only one
   b. two

c. one
d. Infinity

5. In figure, PQ || RS, ∠ QPR = 70°, ∠ ROT = 20° find the value of x.



a. 20°
b. 70°
c. 50°
d. 110°

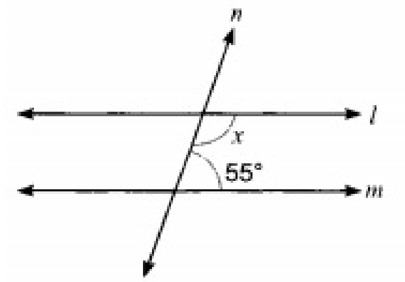
6. Fill in the blanks:

An equation of the type ________ represents a straight line passing through the origin.

7. Fill in the blanks:

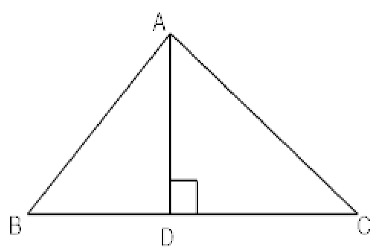
The common between the three angles of a triangle and a linear pair is ________.

8. In Fig., find the value of x for which the lines l and m are parallel.



9. Find the measure of the complementary angle of 60^{o}.

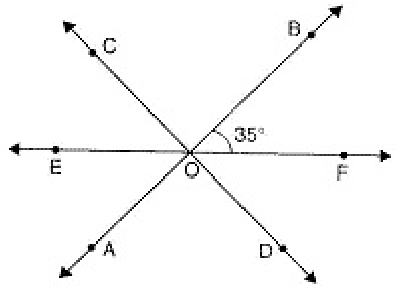
10. In the given figure △ABC is right angled at A. AD is drawn perpendicular to BC. Prove that $\angle BAD = \angle ACB$



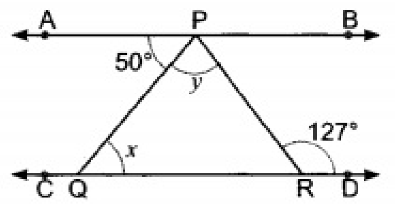
11. Prove that if one angle of a triangle is equal to the sum of other two angles, then the triangle is right angled.

12. The exterior angle of a triangle is 110° and one of the interior opposite angle is 35°. Find the other two angles of the triangle.

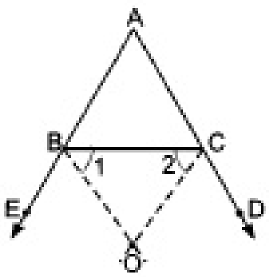
13. AB, CD and EF are three concurrent lines passing through the point O such that OF bisects $\angle$BOD. If $\angle$BOF = 35^{o}. Find $\angle$BOC and $\angle$AOD.



14. In Fig., if $AB \| CD$, $\angle APQ = 50^{\circ}$ and $\angle PRD = 127^{\circ}$, find x and y.



15. In $\triangle$ABC in given figure, the sides AB and AC of $\triangle$ABC are produced to points E and D respectively. If bisectors BO and CO of $\angle$CBE and $\angle$BCD respectively meet at point O, then prove that $\angle$BOC = 90° - $\frac{1}{2}$ $\angle$ A .



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Solution

1. (a) 125°, 125°, 35°

   Explanation: x + 55 = 180° (Sum of supplementary angles or co-interior angles)

   x = 125°

   x = y = 125° (Corresponding angles)

   z + $\angle$EAB = y (Exterior angle property)

   z = 125° - 90° = 35°
2. (c) a right triangle

   Explanation: The sum of the angles of triangle is 180 degrees.

   let the angles of triangle be a , b, c

   we have given that one angle of a triangle is equal to the sum of the other two angles so we have

   c=a + b

   a + b + c = 180

   Substitute c for a +b

   c + c = 180

   2c = 180

   c = 90

   therefore the triangle is a right triangle.
3. (b) 75°

   Explanation:

   $\angle$QPR = $\angle$PRT = 40° (Alternate interior angles)

   In $\triangle$QPR

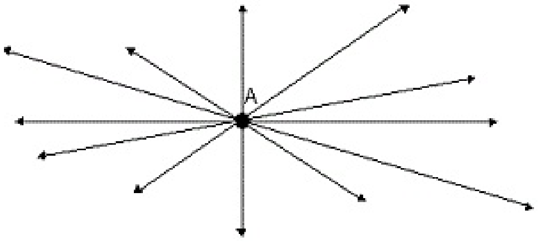
   $\angle$PQR + $\angle$QPR + $\angle$PRQ = 180° (Angle sum property)

   65° + 40° + x° = 180°

   x° = 180° - 40° - 65°

   x° = 75
4. (d) Infinity

   Explanation:



As seen from the above image, any number of lines can be drawn through a given point.

Hence the answer may be given as "Infinity".

5. (c) 50°

   Explanation:

   PQ $\|$ RS

   $\angle$QPR = $\angle$SRO = 70° (Corresponding, Angle)

   NOW IN $\triangle$RTO

   x + 20° = 70° (exterior angle)

   x = 70° - 20°

   x = 50°

6. y = mx

7. 180^{0}

8. Two lines are parallel when angles on the same side of the transversal are supplementary i.e.,

   $x + 55^{\circ} = 180^{\circ} \Rightarrow x = 180^{\circ} - 55^{\circ} \Rightarrow x = 125^{\circ}$

9. The measure of the complementary angle x = $(90^{0} – r^{0})$

   Where r^{0} = given measurement

   $\therefore$ x = $(90^{0} – 60^{0}) = 30^{0}$

10. $\because$ $\mathrm{AD} \perp BC$

    $\therefore \angle ADB = \angle ADC = 90^{0}$

    from $\triangle$ABD

    $\angle\mathrm{ABD} + \angle\mathrm{BAD} + \angle\mathrm{ADB} = 180^{0}$

$\angle ABD + \angle BAD + 90^0 = 180^0$

$\angle ABD + \angle BAD = 90^0$

$\angle$BAD = 90° - $\angle$ABD ..(i)

But $\angle$A + $\angle$B + $\angle$C = 180° $\triangle$ABC

$\angle B + \angle C = 90^0 \because \angle A = 90^0$

$\angle$C = 90° - $\angle$B ...(ii)

From (i) and (ii)

$\angle BAD = \angle C$

$\angle$ BAD $= \angle ACB$ Hence proved

11. Given in ΔABC $\angle B = \angle A + \angle C$

Proof: $\angle A + \angle B + \angle C = 180^o$..... (1) [Sum of three angles of a ΔABC is 180°]

$\angle A + \angle C = \angle B$..... (2)

From (1) and (2)

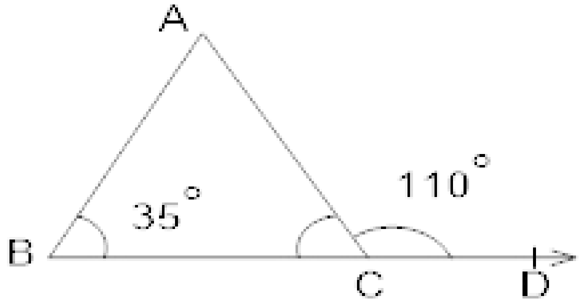
$\angle B + \angle B = 180^o$

$2\angle B = 180^o$

$\angle B = 90^o$

Hence, the triangle is a right angled triangle.

12. Since the exterior angle of a triangle is equal to the sum of interior opposite angles.



$\therefore \angle ACD = \angle A + \angle B$

$110 = \angle A + 35^o$

$\angle A = 110^o - 35^o$

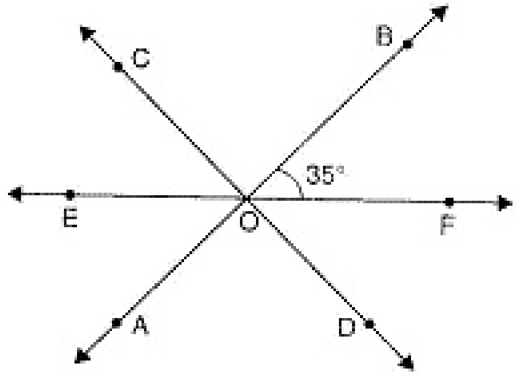
$\angle A = 75^o$

Now, $\angle A + \angle B + \angle C = 180^\circ$ (Angle sum property)

$\angle C = 180 - (\angle A + \angle B)$

$\angle C = 180 - (75^o + 35^o)$

$\angle C = 70^o$

13. 

OF bisects $\angle$BOD . . . [Given]

$\angle$BOF = $\angle$DOF = 35^o

$\angle$COE = $\angle$DOF = 35^o

$\angle$EOF = 180^o . . . . [A straight angle = 180^o]

$\therefore$ $\angle$EOC + $\angle$BOC + $\angle$BOF = 180^o

$\therefore$ 35^o + $\angle$BOC + 35^o = 180^o

$\therefore$ $\angle$BOC = 180^o – 70^o = 110^o

$\angle$AOD = $\angle$BOC . . . [Vertically opposite angles]

= 110^o

14. As $AB \| CD$ and PQ is a transversal.

$\therefore \angle APQ = \angle PQR$ (Alternate interior angles)

$\Rightarrow 50^\circ = x$ ....(1)

Also, $\angle APR = \angle PRD$ (Alternate interior angles) .

$\Rightarrow \angle APQ + \angle QPR = 127^\circ$

$\Rightarrow x + y = 127^\circ$

$\Rightarrow 50^\circ + y = 127^\circ$. [From (1)]

or , y = 127° - 50° = 77°

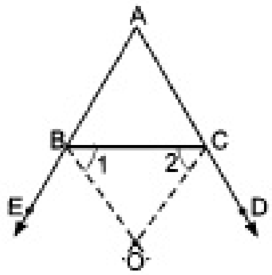
Hence, x = 50° & y = 77°

15. As $\angle$ABC and $\angle$CBE form a linear pair

$\therefore$$\angle$ABC + $\angle$CBE = 180°..........(1)

Given, BO is the bisector of $\angle$CBE. Hence,

$\angle$CBE = 2$\angle$OBC.



$\Rightarrow \angle CBE = 2\angle 1$ ....(2)

Therefore, $\angle ABC + 2\angle 1 = 180°$ [from (1) & (2)]

$\Rightarrow 2\angle 1 = 180° - \angle ABC$

$\Rightarrow \angle 1 = 90° - \frac{1}{2}\angle ABC$........(3)

Again, $\angle ACB$ and $\angle BCD$ form a linear pair

$\therefore \angle ACB + \angle BCD = 180°$.........(4)

Given, CO is the bisector of $\angle BCD$. Hence,

$\angle BCD = 2\angle 2$............(5)

So, $\angle ACB + 2\angle 2 = 180°$ [from (4) & (5)]

$\Rightarrow 2\angle 2 = 180° - \angle ACB$

$\Rightarrow \angle 2 = 90° - \frac{1}{2}\angle ACB$ ...(6)

Now in $\triangle OBC$, we have

$\angle 1 + \angle 2 + \angle BOC = 180°$ (Angle sum property of triangle) ...(7)

From (3), (6) and (7), we have

$90° - \frac{1}{2}\angle ABC + 90° - \frac{1}{2}\angle ACB + \angle BOC = 180°$.

$\Rightarrow \angle BOC = \frac{1}{2}(\angle ABC + \angle ACB)$...........(8)

Now, in $\triangle ABC$, we have

$\angle BAC + \angle ABC + \angle ACB = 180°$

or, $\angle ABC + \angle ACB = 180° - \angle BAC$............(9)

From (8) and (9), we have:-

$\Rightarrow \angle BOC = \frac{1}{2}(180° - \angle BAC)$

Hence, $\angle BOC = 90° - \frac{1}{2}\angle A$ Proved.