SHIKSHA CLASSES

Sub : Maths | **Answer Paper** | **Total Marks : 30**

Class : IX (CBSE) | **6. Lines and Angles**

Section - A (Each 1 Marks)

Multiple Choice Questions. (MCQs)

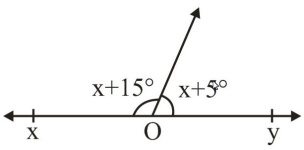
Q.1 : The complement of $(90° - \alpha)$ is :

Ans : d) $\alpha°$

Q.2 : Measure of an angle which is supplement to itself is.

Ans : c) 90°

Q.3 : In figure, the value of x is :

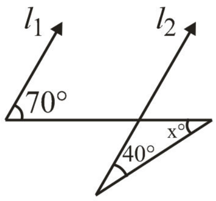


Ans : b) 80°

Q.4 : In ΔABC, $\angle A = \frac{\angle B}{2} = \frac{\angle C}{6}$ then the measure of $\angle A$ is :

Ans : d) 20°

Q.5 : In figure lines $l_1 \parallel l_2$ value of x is :



Ans : b) 30°

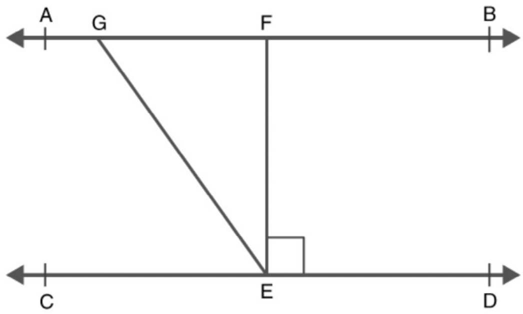
Q.6 : Two angles whose sum is equal to 180° are called:

Ans : d) Supplementary angles

Q.7 : If two lines intersect each other, then the vertically opposite angles are:

Ans : a) Equal

Q.8 : If $AB \parallel CD, EF \perp CD$ and $\angle GED = 135^0$ as per the figure given below.



The value of $\angle AGE$ is:

Ans : d) 135°

Q.9 : An exterior angle of a triangle is 105° and its two interior opposite angles are equal. Each of these equal angles is

Ans : d) 52 ½°

For question number 10 to 11 two statement are given one labeled Assertion and other labeled Reason select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below

Q.10 : Assertion : Sum of the pair of angles 120° and 60° is supplementary.

Reason: Two angles, the sum of whose measures is 180°, are called supplementary angles.

Ans : a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

Q.11 : **Assertion :** If two interior angles on the same side of a transversal intersecting two parallel lines are in the ratio 5:4, then the greater of the two angles is 100^0

Reason: If a transversal intersects two parallel lines, then the sum of the interior angles on the same side of the transversal is 180^0

Ans : a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

Section B (Each 2 Marks)

Q.12 : An angle is $\left(\frac{1}{5}\right)^{th}$ of its complement, find the angles.

Ans : Let one angle be x

then other angle will be $\frac{1}{5}(90-x)$

Now according to the question

$$\frac{1}{5}(90-x) = x$$

$$90 - x = 5x$$

$$90 = 5x + x$$

$$90 = 6x$$

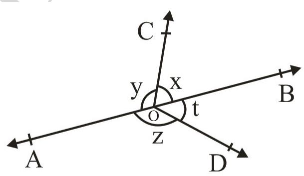
$$x = \frac{90}{6}$$

$$x = 15$$

Thus one angle = x = 15°

one angle = 90 – x = 90 – 15 = 75°

Q.13 : If x + y = z + t in fig. Prove that AOB is a straight line.



Ans : From figure,

$x + y + z + t = 360$ (sum of all angles)

But $x + y = z + t$

$\therefore\ x + y + x + y = 360$

$\Rightarrow 2(x + y) = 360$

$\Rightarrow x + y = \frac{360}{2} = 180°$

$\Rightarrow x + y = 180$

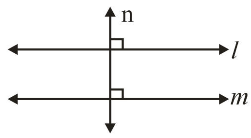
Hence, AOB is a straight line (linear pairs)

OR

If l, m, n are three lines such that $l \parallel m$ and $n \perp l$ then prove that $n \perp m$.

Ans : Given that : $l \parallel m$

and $n \perp l$



It means angle between n and l is 90°

But $l \parallel m$

So, angle between n and m is also 90°

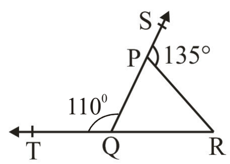
(Corresponding angles are equal)

$\therefore n \perp m$. Hence proved.

Section C (Each 3 marks)

Q.14 : In fig., side QP and RQ of ΔPQR are produced to points S and T respectively. If ∠SPR = 135° and ∠PQT = 110°.

Find ∠PRQ.



Ans : In the figure, ∠SPR = 135° and ∠PQT = 110°

∠PQT + ∠PQR = 180° .....(Linear pair)

$\Rightarrow$ 110° + ∠PQR = 180°

$\Rightarrow$ ∠PQR = 180° – 110° = 70°

Also, ∠SPR + ∠QPR = 180° ..(Linear pair)

$\Rightarrow$ 135° + ∠QPR = 180°

$\Rightarrow$ ∠QPR = 180° – 135° = 45°

Now In ΔPQR

$\Rightarrow \angle PQR + \angle PRQ + \angle QPR = 180$

..... (sum of angles)

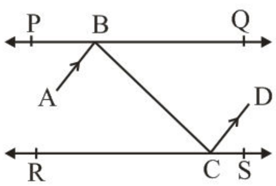
$\Rightarrow 70° + \angle PRQ + 45° = 180°$

$\Rightarrow \angle PRQ = 180 - (70° + 45°) = 65°$

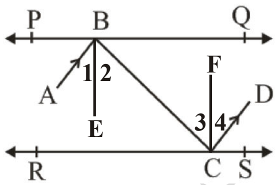
Hence, $\angle PRQ = 65°$

OR

In the figure, PQ and RS are two mirrors placed parallel to each other. An incident ray AB strikes the mirror PQ at B, the reflected ray moves along the path BC and strikes the mirror RS at C and again reflects back along CD. Prove that AB || CD.



Ans : At point B, draw BE $\perp$ PQ and at point C draw CF $\perp$ RS.



$\angle 1 = \angle 2$ ...... (i)

(Angle of incidence is equal to angle of reflection)

$\angle 3 = \angle 4$ ...... (ii) ....(Same reason)

Also,

$\angle 2 = \angle 3$ ...... (ii) ...(Alternate angles)

$\Rightarrow \angle 1 = \angle 4$ ..... [From (i), (ii) & (iii)]

$\Rightarrow 2\angle 1 = 2\angle 4$

$\Rightarrow \angle 1 + \angle 1 = \angle 4 + \angle 4$

$\Rightarrow \angle 1 + \angle 2 = \angle 4 + \angle 3$ .. (From (i) & (ii))

$\Rightarrow \angle BCD = \angle ABC$

Hence, AB || CD .... [Alternate angles are equal]

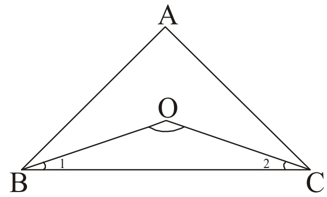
Hence proved.

Q.15 : If the bisectors of the angles of a ΔABC meet at a point 'O', then $\angle BOC = 90° + \frac{1}{2}\angle A$.

Ans : In ΔABC, the bisectors BO and CO of $\angle$B and $\angle$C respectively meet at O.

In ΔABC,

$\angle A + \angle B + \angle C = 180°$



$$\Rightarrow \frac{1}{2}\angle A + \frac{1}{2}\angle B + \frac{1}{2}\angle C = \frac{180^0}{2} = 90^0$$

$$\Rightarrow \frac{1}{2}\angle B + \frac{1}{2}\angle C = 90^0 - \frac{1}{2}\angle A \; ---(i)$$

In ΔBOC,

$$\Rightarrow \frac{1}{2}\angle B + \frac{1}{2}\angle C + \angle BOC = 180^0$$

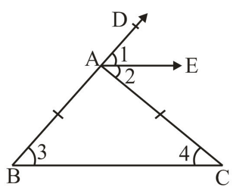
$$\Rightarrow \angle BOC = 180^0 - \left(\frac{1}{2}\angle B + \frac{1}{2}\angle C\right)$$

$$= 180^0 - (90 - \frac{1}{2}\angle A) \text{ (from (i))}$$

$$\Rightarrow \angle BOC = 90 + \frac{1}{2}\angle A \text{ Proved.}$$

Section - D

Q.16 : In the given figure ABC is an isosceles triangle with AB = AC and AE is bisector of exterior angle CAD. Prove that AE || BC.



Ans : In ΔABC

AB = AC (given)

i.e. $\angle 3 = \angle 4$ ---(i)

$\angle 1 = \angle 2$ ---(ii) (AE is bsisector of $\angle DAC$)

Now $\angle 1 + \angle 2 = \angle 3 + \angle 4$

(By Exterior angle property)

$\Rightarrow \angle 2 + \angle 2 = \angle 4 + \angle 4$ (from (i) & (ii)

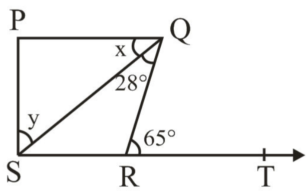
$\Rightarrow 2\angle 2 = 2\angle 4$

$\Rightarrow \angle 2 = \angle 4$

By $\angle 2$ and $\angle 4$ are alternate angles between AE and BC so, AE || BC proved.

OR

In fig., if $PQ \perp PS$, PQ || SR, $\angle SQR = 28°$ and $\angle QRT = 65°$, then find the values of x and y.



Ans : In the given figure,

line $PQ \perp PS$, $PQ \parallel SR$

$\angle SQR = 28°$, and $\angle QRT = 65°$

$\angle PQR = \angle QRT$ .... (Alternate angles)

$\Rightarrow x + 28 = 65°$

$\Rightarrow x = 65° - 28° = 37°$

In ΔPQS,

$\Rightarrow \angle SPQ + \angle PQS + \angle QSP = 180°$

..... (Sum of all angle of Δ)

$\Rightarrow 90 + 37° + y = 180°$

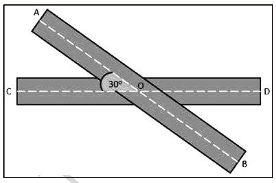
$\Rightarrow y = 180 - 127 = 53°$

Hence, $x = 37°$, $y = 53°$

SECTION - E

Q.17 : Case Study : (Any Four) **4**

Harry was going on a road trip with his father. They were travelling on a straight road. After riding for some distance, they reach a crossroad where one straight road cuts the other at 30^0. Now using the given information, answer the following questions.



i) Find the measure of angle AOD.

Ans : b) 150^0

ii) Find the measure of angle BOD.

Ans : a) 30^0

iii) Find the measure of angle BOC.

Ans : b) 150^0

iv) Which of the following is incorrect?

Ans : c) Both angles in a linear pair are acute Angles in a linear pair can be equal

v) Which of the following is correct?

Ans : c) Vertically opposite angles are made using straight lines

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