SA – I (2016-17)
Class – VII
Mathematics

Chapter 10
Lines and Angles.

Points to Remember

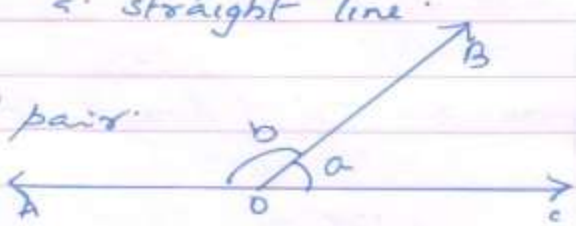
Complementary Angles:- Two angles are said to be complementary if their sum is $90°$.
Eg $(40°, 50°)$, $(30°, 60°)$

Supplementary Angles:- Two angles are said to be supplementary, if the sum is equal to $180°$
Eg. $(70°, 110°)$, $(60°, 120°)$

Adjacent Angles: A pair of angle is said to be adjacent if i) if they have a common vertex ii) if they have a common arm iii) non-common arms lie on either side of common arm.

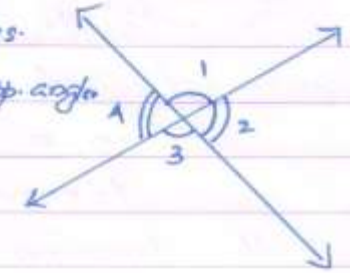
Linear pair: Two adjacent angles ~~are~~ said to be linear pair if their non common arm form a straight line.

$\angle a + \angle b = 180°$
$\angle a$, and $\angle b$ form linear pair.



Vertically Opposite angle: When two lines intersect, the pairs of angles formed without a common arm are called vertically opposite angles.
Eg $(\angle 1, \angle 3)$, $(\angle 2, \angle 4)$ are Vertically opp. angle

Vertically opposite angles are equal in measure. $\angle 1 = \angle 3$, $\angle 2 = \angle 4$.



Exercise 10.1

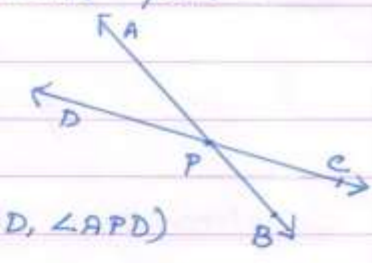
Q1. Find the complement of 67°.

Ans. $90 - 67° = 23°$

Q2. Find the supplement of 126°

Ans $180 - 126° = 54°$

Q3. Name all adjacent angles and linear pair.



Ans. $(\angle APC, \angle CPB), (\angle CPB, \angle BPD)$

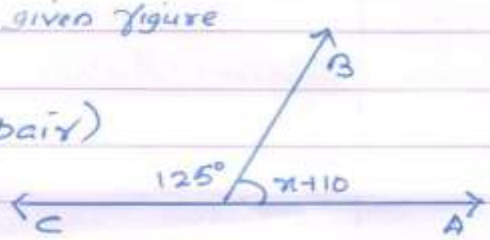
$(\angle BPD, \angle APD)$ $(\angle APD, \angle APC)$

Linear pair $\rightarrow$ $(\angle APC, \angle CPB)$

$(\angle CPB\ \angle BPD), (\angle BPD, \angle APD)$

$(\angle APD, \angle APC)$

Q9. Find the value of x from the given figure



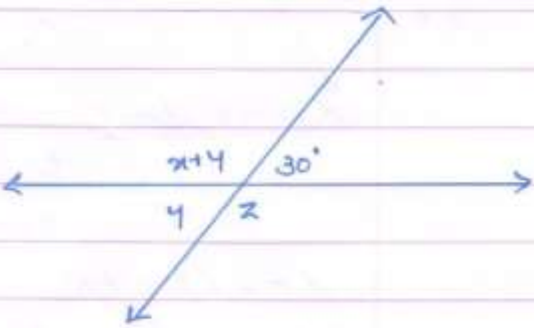
Ans: $x + 10 + 125 = 180°$ (linear pair)

$x + 135 = 180°$

$x = 180 - 135°$

$= \underline{45°}$

Q10



$y = 30°$ (Vertically Opp. angles).

$x + y + 30° = 180°$ (linear pair)

$x + 30 + 30 = 180°$

$x = 180° - 60° = 120°$

$30 + z = 180°$ (linear pair).

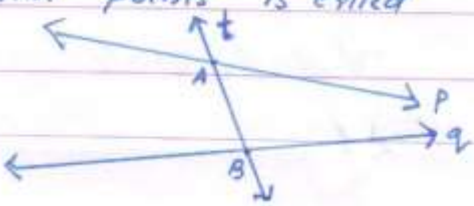
$z = 180 - 30°$

$= 150°$

$\therefore \underline{x = 120°}, \underline{y = 30°}, \underline{z = 150°}$

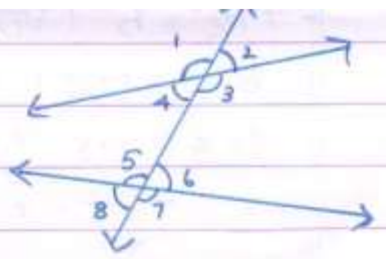
Points To Remember

Transversal:- A line intersecting two or more given lines in a plane at different points is called transversal.



't' is the transversal of 'p and q'

Angles formed by a transversal.



1. **Interior Angles:**
   $\angle 4, \angle 3, \angle 5,$ and $\angle 6$.

2. **Exterior Angles:** $\angle 1, \angle 2, \angle 8, \angle 7$.

3. **Pairs of Corresponding Angles:** $(\angle 1, \angle 5), (\angle 2, \angle 6)\ (\angle 3, \overset{\angle 7}{\cancel{\angle 8}})$
   $(\angle 4, \angle 8)$

4. **Pairs of Alternate interior Angles.** $(\angle 4, \angle 6), (\angle 5, \angle 3)$

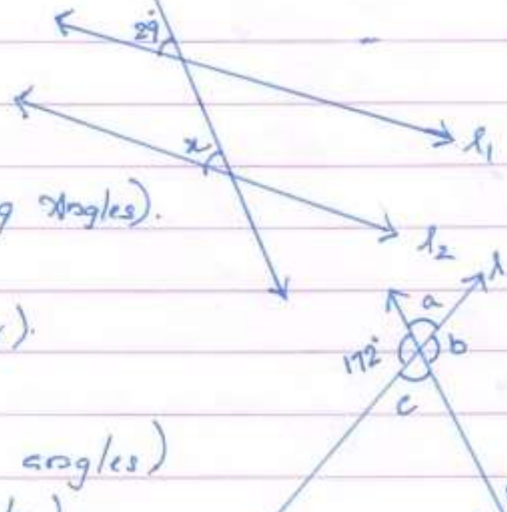
5. **Pairs of Alternate exterior Angles.** $(\angle 1, \angle 7)\ (\angle 8, \angle 2)$

6. **Co-interior Angles.** $(\angle 3, \angle 6), (\angle 4, \angle 5)$

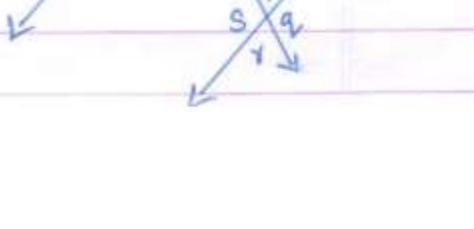
Properties of Parallel lines

If two parallel lines are intersected by a transversal then
i) each pairs of corresponding angles are equal.
ii) each pairs of alternate interior angles are equal.
iii) each pairs of co-interior angles are supplementary.

Exercise 10:2.



Q2. a)
$l_1 \parallel l_2$.
$\therefore x = 29^\circ$ (Corresponding Angles).



Q3. $a + 172^\circ = 180^\circ$ (linear pair).
$\therefore a = 180 - 172^\circ = 8^\circ$
$a = c = 8^\circ$ (Vertically opposite angles)
$c = r = 8^\circ$ (corresponding angles)
$r = p = 8^\circ$ (Vertically Opposite angles).

$172° = b$ (Vertically Opposite angles)

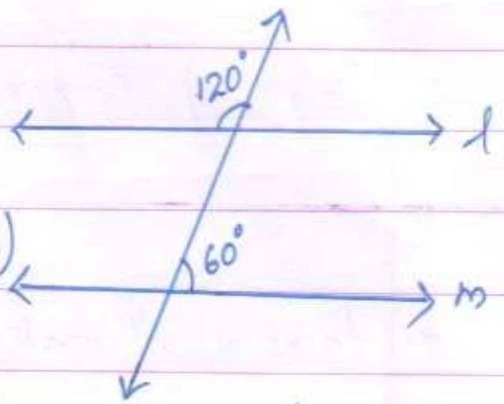
$b = s = 172°$ (Alternate interior Angles).

$s = q = 172°$ (Vertically Opposite angles).

$\therefore\ \underline{\underline{a = c = p = r = 8°}}\ ,\ b = s = q = 172°$

Q4. Check wheather $l \parallel m$ in ~~each~~ the following figure

a.



Let the angle opposite to $120°$ be x.

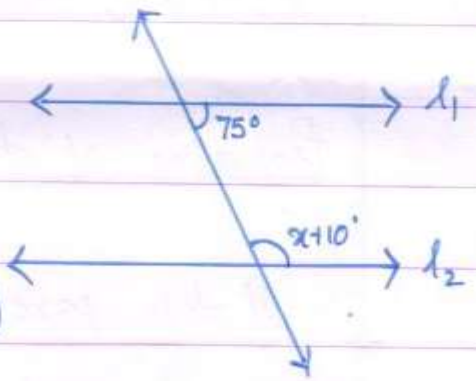
$x = 120°$ (Vertically Opposite angle)

$x + 60° \Rightarrow 120° + 60° = 180°$

Since the co-interior angles are supplementary

$\underline{\underline{l \parallel m}}$

Q5. a. If l_1 is parallel to l_2, find the value of x.



$75° + x + 10 = 180°$ (Co-interior angles)

$85° + x = 180°$

$x = 180 - 85° = \underline{\underline{95°}}$

$\underline{\underline{x = 95°}}$

Chapter 12
Symmetry.

Points To Remember:

Line of Symmetry:- If a line divides a figure into two parts such that when the figure is folded about the line the two parts of the figure coincide, then the line is known as the line of symmetry.

Shapes	No. of lines of symmetry
line segment	2.
an angle	1.
isosceless triangle	1
parallelogram	0
Rhombus	2
Rectangle	2
Semicircle	1
Circle	infinite
Regular polygon with n sides	'n'

Rotational Symmetry: A figure is said to have Rotational symmetry if it fits into itself more than once during a full turn i.e Rotation through 360°

Angle of Rotation: The angle through which an object Rotates (turns) about a fixed point is known as the angle of Rotation.

Order of Rotation: The number of times a figure fits onto itself in one full turn is called the order of Rotation.

Exerlise 12.2.

Q2. Which number in our number system has both Reflection symmetry and Rotational symmetry?

Ans: 1, 3, 8

Q8 Give two examples.

a) English letters which have both rotational and Reflection symmetries → H, X

b) English letters which have Rotational symmetry but no Reflection symmetry → Z, S.

Q10. Can we have shapes whose order of rotational symmetry is more than 1 and the angle of rotation is a) $22\frac{1}{2}^\circ$

$\left.\begin{array}{l}\text{order of}\\ \text{rotation}\end{array}\right\} = 360^\circ \div 22\frac{1}{2}^\circ = 16$

⟹ Yes since the order of rotation is a whole no.

c) 16°

order of rotation $= 360 \div 16 = 22.5$.

⟹ No, Since the order of rotation is not a whole No.

Q11. Name the following

a) A triangle with rotational symmetry of order more than 1. → Equilateral triangle.

b). A triangle with rotational symmetry of order 1 and no. of line of symmetry → Scalene triangle.

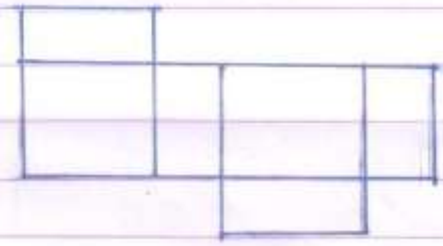
Chapter 13.

Visualising Solid Shapes.

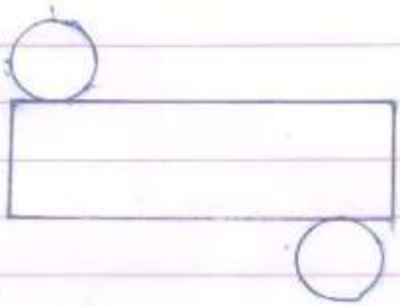
Solid	Face	Edges	Vertices
a) Cuboid	6	12	8
b Cube	6	12	8
c) Triangular pyramid	4	6	4.
d). Hexagonal Prism	8	18	12

Nets of Solids

Cuboid



Cylinder



Cone.

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