



# SHIKSHA CLASSES

Sub. : Maths

Answer Paper

Marks : 20

Std. : VIII<sup>th</sup> - S.B.

2.Parallel lines and transversal

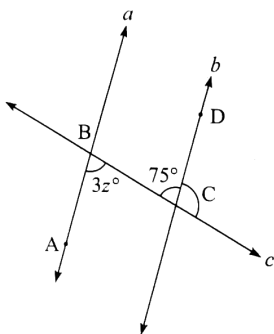
**Q.1 :** A) Select the most appropriate Alternative. 02

1) When two parallel lines are intersected by a transversal, \_\_\_\_\_ angles are formed.

Ans : c) eight

2) In the figure, line a || line b and line c is the transversal.

$\angle ABC = 3z^\circ$  and  $\angle BCD = 75^\circ$ , then value of z is



Ans : a) 25

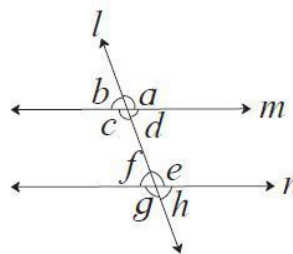
: B) Solve the following. 01

1) Define "Transversal"

Ans : If a line intersects given two lines in two distinct points then that line is called a transversal of those two lines.

**Q.2 :** A) Solve any one of the following. (Activity) 02

1) In the adjoining figure line m || line n line l is a transversal. If  $m \angle b = (x + 15)^\circ$  and  $m \angle e = (2x + 15)^\circ$ , find the value of x.



Ans :  $\angle b \cong \angle f$ ... (corresponding angles)  
 $m \angle f = m \angle b = (x + 15)^\circ$

$m \angle f + m \angle e = 180^\circ$  --- (Angles in linear pair)

substituting values in the equation,

$$x + 15 + \boxed{2x + 15} = 180^\circ$$

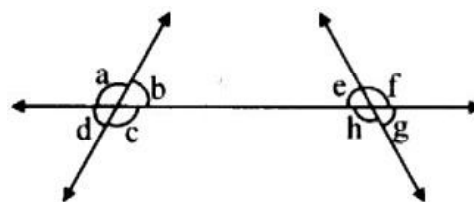
$$\therefore 3x + \boxed{30} = 180^\circ$$

$$\therefore 3x = 180^\circ - 30^\circ = \boxed{150^\circ} \text{ --- (subtracting 30 from both sides)}$$

$$\therefore x = \frac{150^\circ}{3} \text{ --- (dividing both sides by 3)}$$

$$\therefore x = \boxed{50^\circ}$$

2) Observe the angles shown in the figure and write the following pair of angles.



1) Interior alternate angles

2) Corresponding angles

Ans : Interior alternate angles :

i)  $\angle c$  and  $\boxed{\angle e}$     ii)  $\boxed{\angle b}$  and  $\angle h$

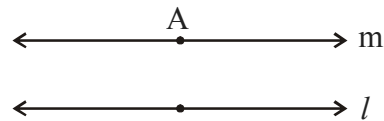
Corresponding angles :

i)  $\angle a$  and  $\angle e$     ii)  $\angle d$  and  $\boxed{\angle h}$

iii)  $\angle b$  and  $\boxed{\angle f}$     iv)  $\angle c$  and  $\angle g$

: B) Solve any one of the following.    02

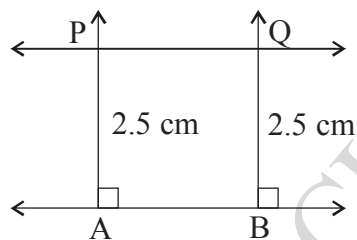
1) Draw a line  $l$ . Take a point A outside the line. Through point A draw a line parallel to line  $l$ .

Ans : 

2) Draw a line parallel to line  $l$  at a distance of 2.5cm.

Ans : Steps of construction :

- i) Draw a line  $l$ .
- ii) Mark two distinct point A and B on line  $l$
- iii) Draw perpendiculars (either using set square, protractor or compass) to line  $l$  passing through points A and B.



iv) On these perpendicular lines take points P and Q respectively such that  $l(PA) = l(QB) = 2.5$  cm.

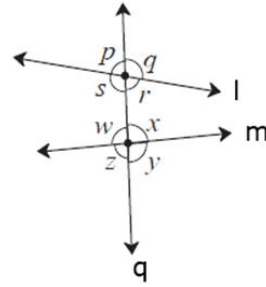
v) Draw line PQ.

vi) Line PQ is a line parallel to the line  $l$  at a distance of 2.5 cm.

Q.3 : A) Solve any one of the following. (Activity)    03

1) In the figure, each angle is

shown by a letter. Fill in the boxes with the help of the figure.



Corresponding angles :

1)  $\angle p$  and \_\_\_\_\_    2)  $\angle q$  and \_\_\_\_\_

3)  $\angle r$  and \_\_\_\_\_    4)  $\angle s$  and \_\_\_\_\_

Interior alternate angles :

5)  $\angle s$  and \_\_\_\_\_    6)  $\angle w$  and \_\_\_\_\_

Ans : Corresponding angles :

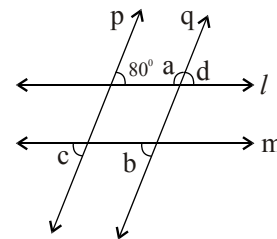
1)  $\angle p$  and  $\boxed{\angle w}$     2)  $\angle q$  and  $\boxed{\angle x}$

3)  $\angle r$  and  $\boxed{\angle y}$     4)  $\angle s$  and  $\boxed{\angle z}$

Interior alternate angles :

5)  $\angle s$  and  $\boxed{\angle x}$     6)  $\angle w$  and  $\boxed{\angle r}$

2) In the given figure, line  $p \parallel$  line  $q$ . Line  $l \parallel$  line  $m$ . Find measures of  $\angle a$ ,  $\angle b$  and  $\angle c$ , using the measure of given angle. Justify your answers.



Ans : Consider  $\angle d$  as shown.

Line  $p \parallel q$  and line  $l$  is the transversal.

$\therefore m\angle d = \boxed{80^\circ}$  (Corresponding angles)

$m\angle d + m\boxed{\angle a} = 180^\circ$  --- (Angles in linear pair)

$\therefore \boxed{80^\circ} + m\angle a = 180^\circ$

$$\therefore m\angle a = 180^\circ - \boxed{80^\circ}$$

$$\therefore m\angle a = \boxed{100^\circ}$$

Line  $l \parallel$  line  $m$  and line  $q$  is the transversal,  
 $\angle b \cong \angle d$  ---(Exterior alternate angles)

$$\therefore m\angle b = m\angle d$$

$$\therefore m\angle b = \boxed{80^\circ}$$

Line  $p \parallel$  line  $q$  and line  $m$  is the transversal,  
 $\angle c \cong \angle b$  ---(Corresponding angles)

$$\therefore m\angle c = m\angle b$$

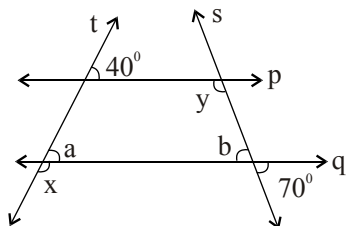
$$\therefore m\angle b = 80^\circ$$

$$m\angle a = 100^\circ, m\angle b = 80^\circ \text{ and}$$

$$m\angle c = 80^\circ.$$

**B) Solve any one of the following. 03**

**1) In the given figure, line  $p \parallel$  line  $q$ . Line  $t$  and line  $s$  are transversals. Find measures of  $\angle x$  and  $\angle y$  using the measures of angles given in the figure.**



**Ans :** Consider  $\angle a$  and  $\angle b$  as shown in the figure. Line  $p \parallel$  line  $q$  and line  $t$  is the transversal.

$$\therefore m\angle a = 40^\circ \text{ ---(Corresponding angles)}$$

$$m\angle x + m\angle a = 180^\circ$$

--- (Angles in a linear pair)

$$\therefore m\angle x + 40^\circ = 180^\circ$$

$$\therefore m\angle x + 180^\circ - 40^\circ$$

$$\therefore m\angle x + 140^\circ$$

$$m\angle b = 70^\circ \text{ ---(Vertically opposite angles)}$$

Line  $p \parallel q$  and line  $s$  is the transversal

$$m\angle y + m\angle b = 180^\circ \text{ ---(Interior angles)}$$

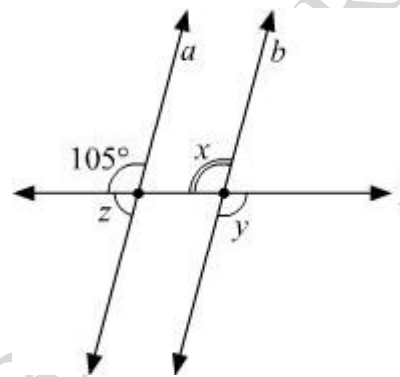
$$\therefore m\angle y + 70^\circ = 180^\circ$$

$$\therefore m\angle y = 180^\circ - 70^\circ$$

$$\therefore m\angle y = 110^\circ$$

Thus,  $m\angle x = 140^\circ, m\angle y = 110^\circ$ .

**2) In the given figure, line  $a \parallel$  line  $b$ . Line  $l$  is a transversal. Find the measures of  $\angle x, \angle y, \angle z$  using the given information.**



**Ans :** Line  $a \parallel$  line  $b$  and line  $l$  the transversal,

$$m\angle x = 105^\circ \text{ --- (Corresponding angles)}$$

$$\angle y \cong \angle x \text{ ---(Vertically opposite angles)}$$

$$\therefore m\angle y = m\angle x$$

$$\therefore m\angle y = 105^\circ$$

$$\therefore m\angle z + 105^\circ = 180^\circ$$

--- (Angles in a linear pair)

$$\therefore m\angle z = 180^\circ - 105^\circ$$

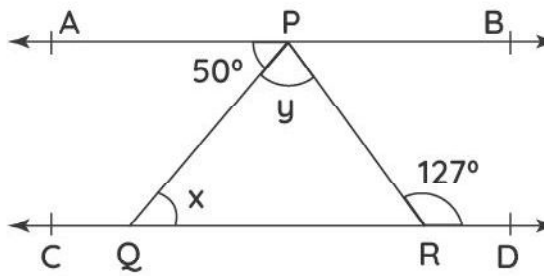
$$\therefore m\angle z = 75^\circ.$$

Thus,  $m\angle x = 105^\circ, m\angle y = 105^\circ$  and

$$m\angle z = 75^\circ.$$

**Q.4 : Solve any one of the following. 04**

**1) In the figure, if  $AB \parallel CD$ ,  $\angle APQ = 50^\circ$  and  $\angle PRD = 127^\circ$ , Find  $x$  and  $y$ .**



**Ans :** We are given that  $AB \parallel CD$ ,  $\angle APQ = 50^\circ$  and  $\angle PRD = 127^\circ$

we need to find the value of  $x$  and  $y$  in the figure.

$\angle APQ = x = 50^\circ$  (Alternate interior angles)

$\angle PRD = \angle APR = 127^\circ$  (Alternate interior angles)

$\angle APR = \angle QPR + \angle APQ$

$$127^\circ = y + 50^\circ$$

$$\therefore y = 77^\circ$$

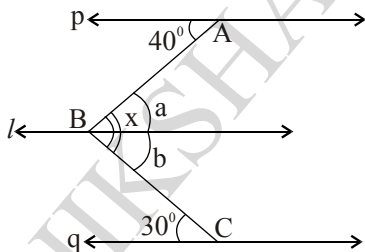
Therefore, we can conclude that  $x = 50^\circ$  and  $y = 77^\circ$

Alternatively,  $127^\circ = y + x$  (because exterior angle is equal to the sum of interior opposite angles).

$$\text{So, } 127^\circ = y + 50^\circ$$

Which gives,  $x = 50^\circ$  and  $y = 77^\circ$ .

**2) In the given figure, line  $p \parallel$  line  $l \parallel$  line  $q$ . Find  $\angle x$  with the help of the measures given in the figure.**



**Ans :** Consider  $\angle a$  and  $\angle b$  as shown :

Line  $p \parallel$  line  $l$  and  $AB$  is the transversal.

$$\therefore m\angle a = 40^\circ \quad \text{---(Alternate angles)}$$

Line  $l \parallel$  line  $q$  and  $BC$  is the transversal.

$$\therefore m\angle b = 30^\circ \quad \text{---(Alternate angles)}$$

$$m\angle x = m\angle a + m\angle b$$

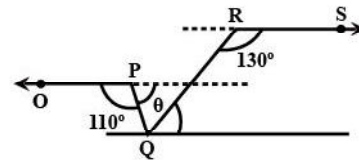
$$\therefore m\angle x = 40^\circ + 30^\circ$$

$$\therefore m\angle x = 70^\circ$$

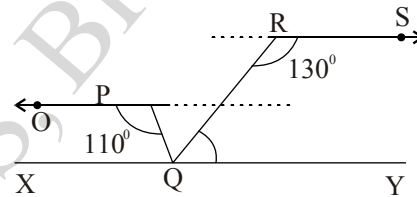
Thus,  $m\angle x = 70^\circ$ .

**Q.5 : Solve any one of the following. 03**

**1) In a figure, if  $OP \parallel RS$ ,  $\angle OPQ = 110^\circ$  and  $\angle QRS = 130^\circ$ , then Find  $\angle PQR$ :**



**Ans :** Draw a line  $XY \parallel OP$  which passes through  $Q$ .



Now, line  $OP \parallel$  line  $XY$ , and line  $PQ$  is transversal

$$\text{So, } \angle PQX + \angle OPQ = 180^\circ$$

---(Co-interior angles)

$$\therefore \angle PQX + 110^\circ = 180^\circ$$

$$\therefore \angle PQX = 180^\circ - 110^\circ$$

$$\therefore \angle PQX = 70^\circ \quad \text{--- (i)}$$

line  $RS \parallel$  line  $OP \parallel$  line  $XY$

$$\therefore \angle SRQ = \angle RQX \text{ (Alternate angles)}$$

$$\therefore \angle RQX = 130^\circ \dots\dots(ii)$$

$$\text{But } \angle RQX = \angle PQR + \angle PQX$$

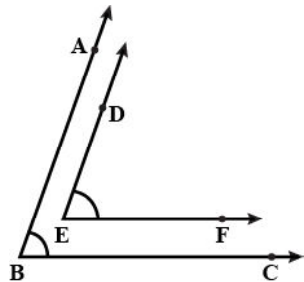
$$\therefore 130^\circ = \angle PQR + 70^\circ \text{ (from (i) and (ii))}$$

$$\therefore \angle PQR = 130^\circ - 70^\circ$$

$$\therefore \angle PQR = 60^\circ.$$

**2) In a figure BA || ED and BC || EF show that  $\angle ABC = \angle DEF$**

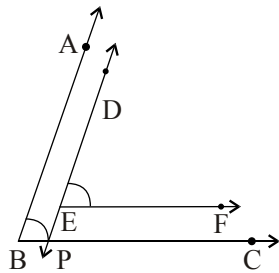
**(Hint : Produce DE to intersect BC at P)**



**Ans :** Given BA || ED and BC || EF

To show :  $\angle ABC = \angle DEF$

Construction : Draw a ray EP opposite to ray ED.



**Proof :** In figure, BA || ED or BA || DP

$$\therefore \angle ABP = \angle EPC \text{ [corresponding angles]}$$

$$\therefore \angle ABC = \angle EPC \text{ --- (i)}$$

Again, BC || EF or PC || EF

$$\therefore \angle DEF = \angle EPC \text{ [Corresponding angles]}$$

---(ii)

From equation (i) and (ii)

$$\angle ABC = \angle DEF.$$

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