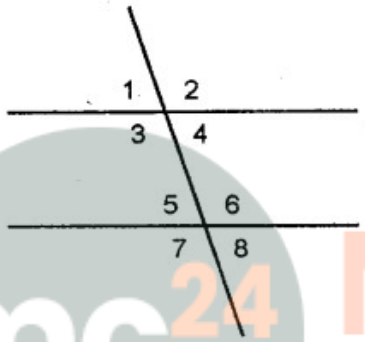
EXERCISE 25 (B)

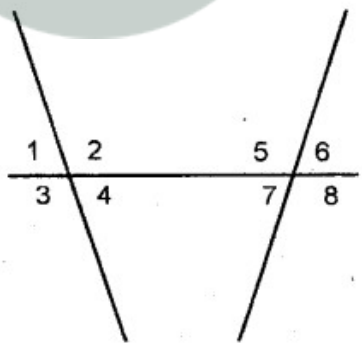
Question 1.

Identify the pair of angles in each of the figure given below :
adjacent angles, vertically opposite angles, interior alternate angles, corresponding angles or exterior alternate angles.

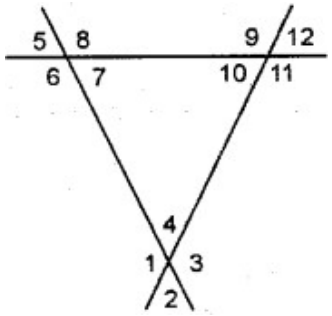
(*a*) (*i*) $\angle 2$ and $\angle 4$ (*ii*) $\angle 1$ and $\angle 8$
(*iii*) $\angle 4$ and $\angle 5$ (*iv*) $\angle 1$ and $\angle 5$
(*v*) $\angle 3$ and $\angle 5$



(*b*) (*i*) $\angle 2$ and $\angle 7$ (*ii*) $\angle 4$ and $\angle 8$
(*iii*) $\angle 1$ and $\angle 8$ (*iv*) $\angle 1$ and $\angle 5$
(*v*) $\angle 4$ and $\angle 7$



(*c*) (*i*) $\angle 1$ and $\angle 10$ (*ii*) $\angle 6$ and $\angle 12$
(*iii*) $\angle 8$ and $\angle 10$ (*iv*) $\angle 4$ and $\angle 11$
(*v*) $\angle 2$ and $\angle 8$ (*vi*) $\angle 5$ and $\angle 7$

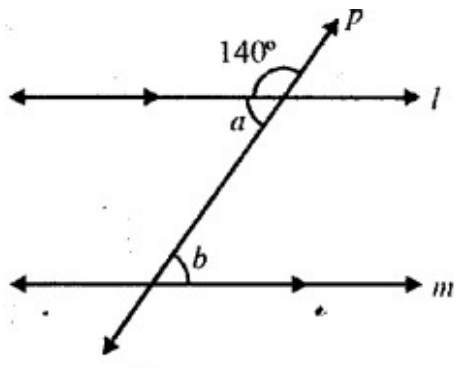


Solution:
(a) (i) Adjacent angles
(ii) Alternate exterior angles
(iii) Interior alternate angles
(iv) Corresponding angles
(v) Allied angles
(b) (i) Alternate interior angles
(ii) Corresponding angles

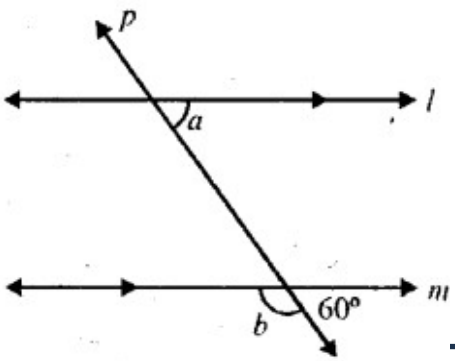
(iii) Alternate exterior angles
(iv) Corresponding angles
(v) Allied angles.
(c) (i) Corresponding
(ii) Alternate exterior
(iii) Alternate interior
(iv) Alternate interior
(v) Alternate exterior
(vi) Vertically opposite

Question 2.
Each figure given below shows a pair of parallel lines cut by a transversal For each case, find a and b, giving reasons.

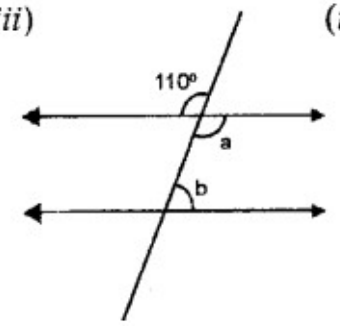
(i)



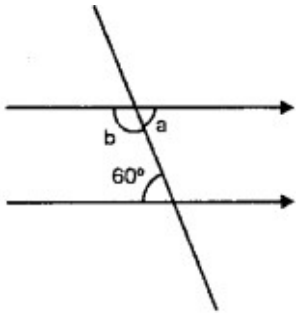
(ii)



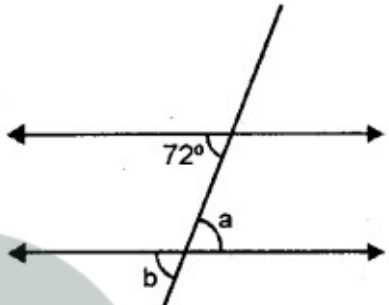
(iii)



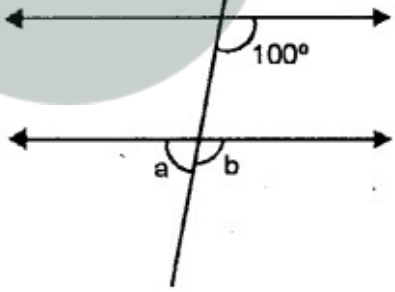
(iv)



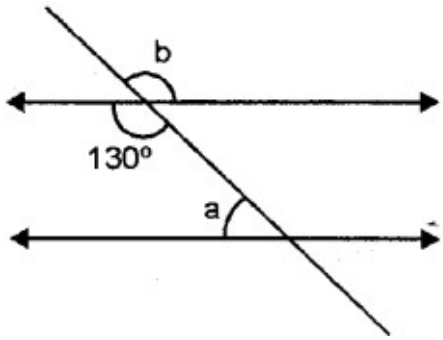
(v)



(vi)



(vii)



(*i*) $a + 140^\circ = 180^\circ$ (Linear pair)

$\therefore\ a = 180^\circ - 140^\circ = 40^\circ$

But $b = a$ (alternate angles)

$= 40^\circ$

$\therefore\ a = 40^\circ, b = 40^\circ$

(*ii*) $\because\ l \parallel m$ and p intersects them

$b + 60^\circ = 180^\circ$ (Linear pair)

$\therefore\ b = 180^\circ - 60^\circ = 120^\circ$

and $a = 60^\circ$ (corresponding angle)

$\therefore\ a = 60^\circ, b = 120^\circ$

(*iii*) $a = 110^\circ$ [Vertically opp. angles]

$b = 180^\circ - a$ [Co-interior angles]

$= 180^\circ - 110^\circ = \mathbf{70^\circ}$

(*iv*) $a = 60^\circ$ [Alternate int. angles]

$b = 180^\circ - a$ [Co-interior angles]

$= 180^\circ - 60^\circ = \mathbf{120^\circ}$

(*v*) $a = 72^\circ$ [Alternate int. angles]

$b = a$ [Vertically opp. angles]

i.e., $b = \mathbf{72^\circ}$

(*vi*) $b = 100^\circ$ [Corresponding angles]

$a = 180^\circ - b$ [Linear Pair of angles]

$a = 180^\circ - 100^\circ = \mathbf{80^\circ}$

(*vii*) $a = 180^\circ - 130^\circ = 50^\circ$ [Co-interior angle]

$b = \mathbf{130^\circ}$ [Vertically opposite angles]

(*viii*) $b = 62^\circ$ [Corresponding angles]

$a = 180^\circ - b$ [Linear pair of angles]

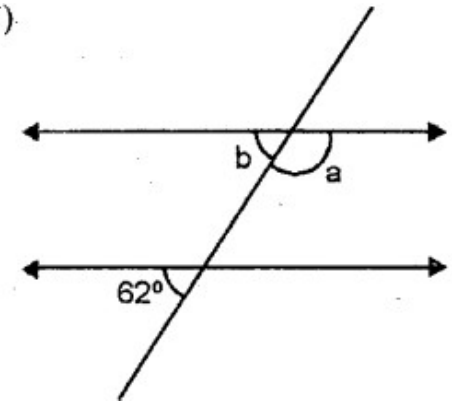
$a = 180^\circ - 62^\circ = \mathbf{118^\circ}$

(*ix*) $a = 180^\circ - 90^\circ$ [Linear pair of angles]

$= 90^\circ$

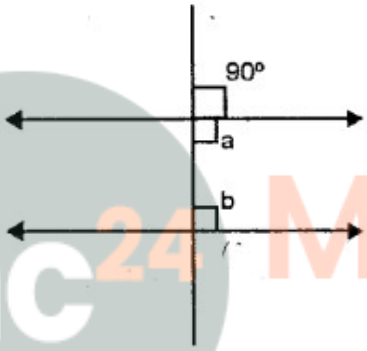
$b = \mathbf{90^\circ}$ [Corresponding angles]

(viii)



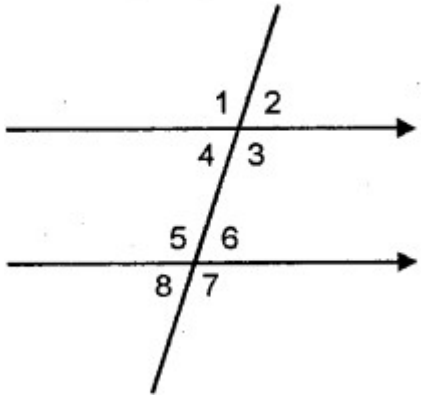
Solution:

(ix)



Question 3.

If ∠1 = 120°, find the measures of : ∠2, ∠3, ∠4, ∠5, ∠6, ∠7 and ∠8. Give reasons.



Solution:

$l \parallel m$ and p is their transversal and $\angle 1 = 120^\circ$

$\angle 1 + \angle 2 = 180^\circ$ (Straight line angle)

$\therefore\ 120^\circ + \angle 2 = 180^\circ \Rightarrow \angle 2 = 180^\circ - 120^\circ = 60^\circ$

$\therefore\ \angle 2 = 60^\circ$

But $\angle 1 = \angle 3$ (Vertically opposite angles)

$\therefore\ \angle 3 = \angle 1 = 120^\circ$

Similarly $\angle 4 = \angle 2$

(Vertically opposite angles)

$\therefore\ \angle 4 = 60^\circ$

$\angle 5 = \angle 1$ (Corresponding angles)

$\therefore\ \angle 5 = 120^\circ$

Similarly $\angle 6 = \angle 2$ (Corresponding angles)

$\therefore\ \angle 6 = 60^\circ$

$\angle 7 = \angle 5$ (Vertically opposite angles)

$\therefore\ \angle 7 = 120^\circ$

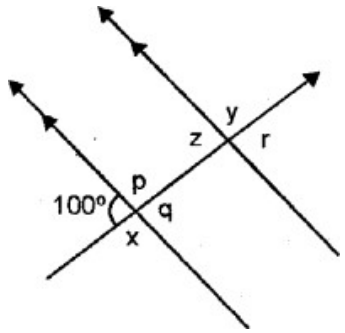
and $\angle 8 = \angle 6$ (Vertically opposite angles)

$\therefore\ \angle 8 = 60^\circ$

Hence $\angle 2 = 60^\circ$, $\angle 3 = 120^\circ$, $\angle 4 = 60^\circ$, $\angle 5 = 120^\circ$, $\angle 6 = 60^\circ$, $\angle 7 = 120^\circ$ and $\angle 8 = 60^\circ$

Question 4.

In the figure given below, find the measure of the angles denoted by x,y, z,p,q and r.



Solution:

$x = 180 - 100$ [L.P. of angles] $= 80^\circ$

$y = x$ [Alternate ext. angles]

$= \mathbf{80^\circ}$

$z = 100^\circ$ [Corresponding angles]

$p = x$ [Vertically opp. angles]

$= \mathbf{80^\circ}$

$q = 100^\circ$ [Vertically opp. angles]

$r = q$ [Corresponding angles]

$= \mathbf{100^\circ}$

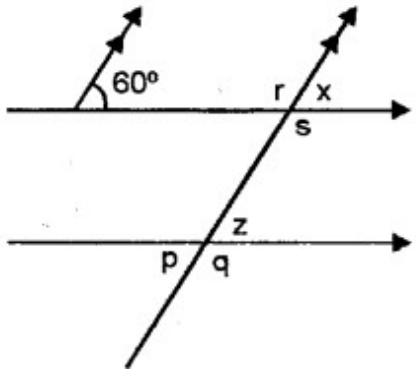
Question 5.

Using the given figure, fill in the blanks.

$\angle x$ = ... ; $\angle z$ = ... ;

$\angle p$ = ... ; $\angle q$ = ... ;

$\angle r$ = ... ; $\angle s$ = ... ;



Solution:

$x = 60^\circ$ [Corresponding angles]

$z = x$ [Corresponding angles]

$= 60^\circ$

$p = z$ [Vertically opp. angles]

$= 60^\circ$

$q = 180 - P$ [Linear Pair of angles]

$= 180 - 60 = 120^\circ$

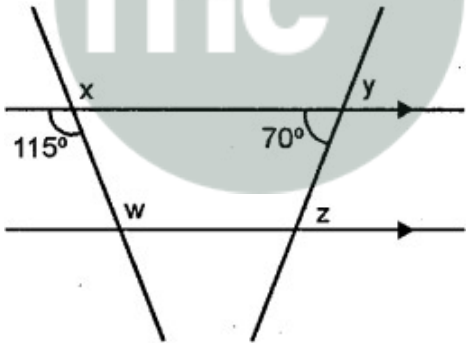
$r = 180 - x$ [Linear Pair of angles]

$= 180 - 60 = 120^\circ$

$s = r$ [Vertically opp. angles] $= 120^\circ$

Question 6.

In the given figure, find the anlges shown by x,y, z and w. Give reasons.



Solution:

$x = 115^\circ$ [Vertically of angles

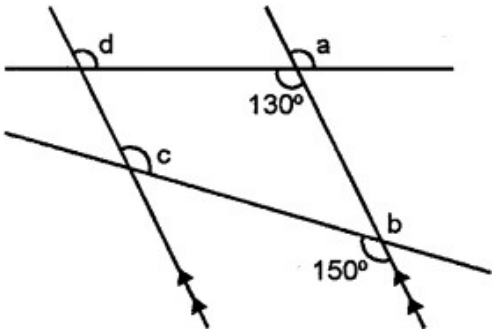
$y = 70^\circ$ [Vertically opp. angles

$z = 70^\circ$ [Alternate int. angles

$w = 115^\circ$ [Alternate int. angles

Question 7.

Find a, b, c and d in the figure given below :



Solution:

$a = 130°$ [Vertically opp. angles]

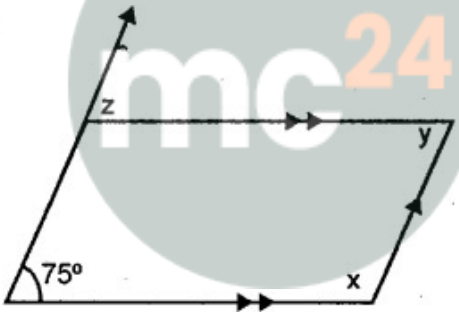
$b = 150°$ [Vertically opp. angles]

$c = 150°$ [Alternate interior angles]

$d = 130°$ [Alternate interior angles]

Question 8.

Find x, y and z in the figure given below :



Solution:

$x = 180 - 75$ [Co-interior angles

$= 105°$

$y = 180 - x$ [Co-interior angles

$= 180 - 105 = 75°$

$z = 75°$ [Corresponding angles