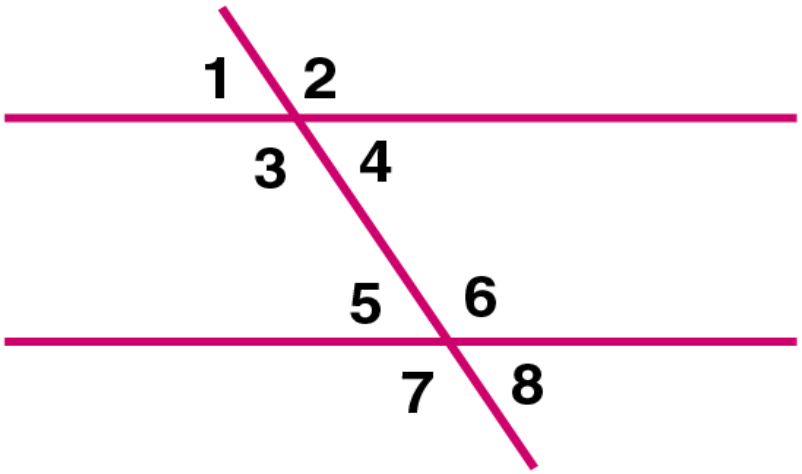
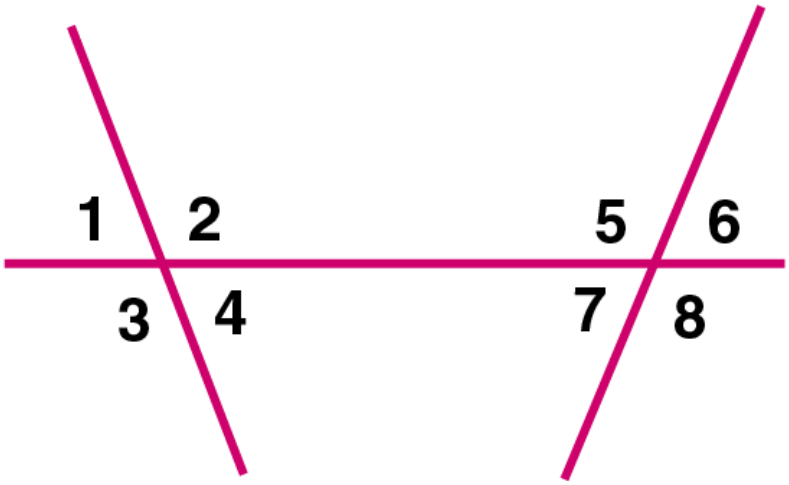
## EXERCISE 25(B)

**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.**

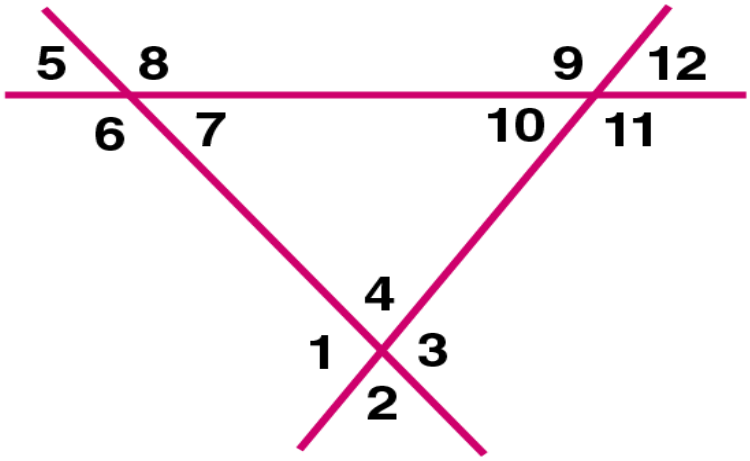
**(a) (i) ∠2 and ∠4**
**(ii) ∠1 and ∠8**
**(iii) ∠4 and ∠5**
**(iv) ∠1 and ∠5**
**(v) ∠3 and ∠5**




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

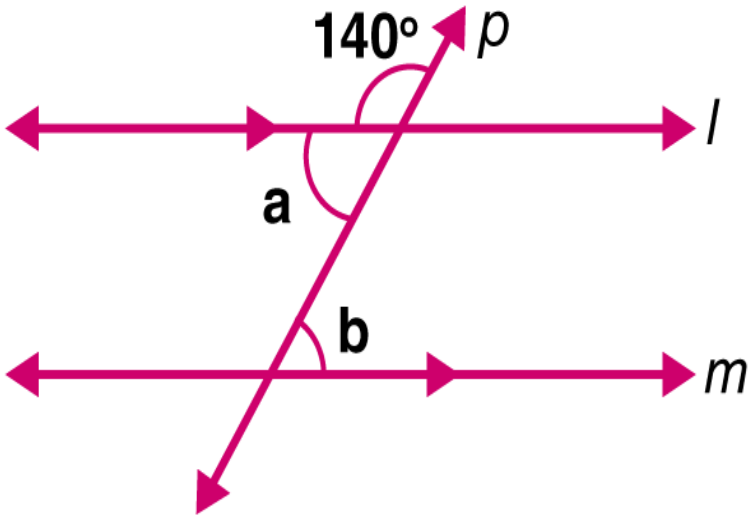


**(c) (i) ∠1 and ∠10**
**(ii) ∠6 and ∠12**
**(iii) ∠8 and ∠10**
**(iv) ∠4 and ∠11**
**(v) ∠2 and ∠8**
**(vi) ∠5 and ∠7**

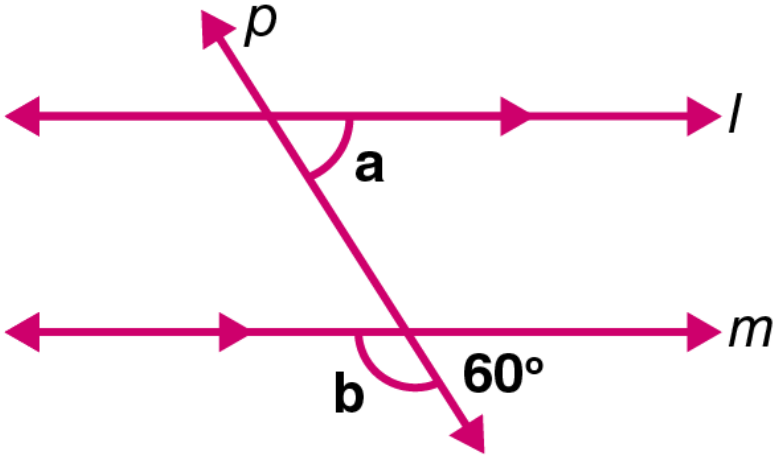



**Solution:**
(a) (i) ∠2 and ∠4 = Adjacent angles
(ii) ∠1 and ∠8 = Alternate exterior angles
(iii) ∠4 and ∠5 = Alternate interior angles
(iv) ∠1 and ∠5 = Corresponding angles
(v) ∠3 and ∠5 = Allied angles
(b) (i) ∠2 and ∠7 = Alternate interior angles
(ii) ∠4 and ∠8 = Corresponding angles
(iii) ∠1 and ∠8 = Alternate exterior angles
(iv) ∠1 and ∠5 =Corresponding angles
(v) ∠4 and ∠7 = Allied angles
(c)(i) ∠1 and ∠10 = Corresponding angles
(ii) ∠6 and ∠12 = Alternate exterior angles
(iii) ∠8 and ∠10 = Alternate interior angles
(iv) ∠4 and ∠11 = Alternate interior angles
(v) ∠2 and ∠8 = Alternate exterior angles
(vi) ∠5 and ∠7 = Vertically opposite angles

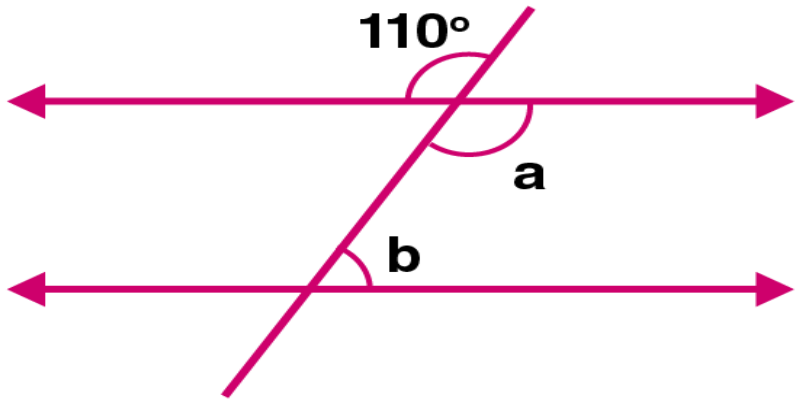
**2. Each figure given below shows a pair of parallel lines cut by a transversal. For each case, find a and b, giving reasons.**
**(i)**



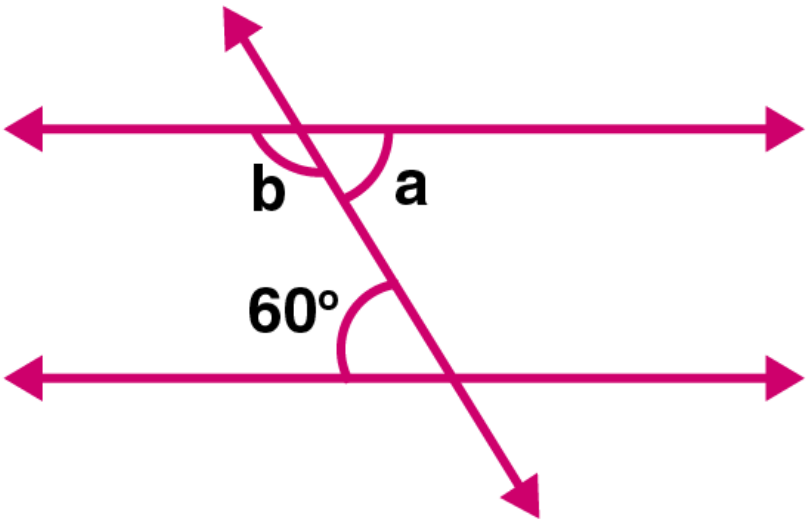

(ii)



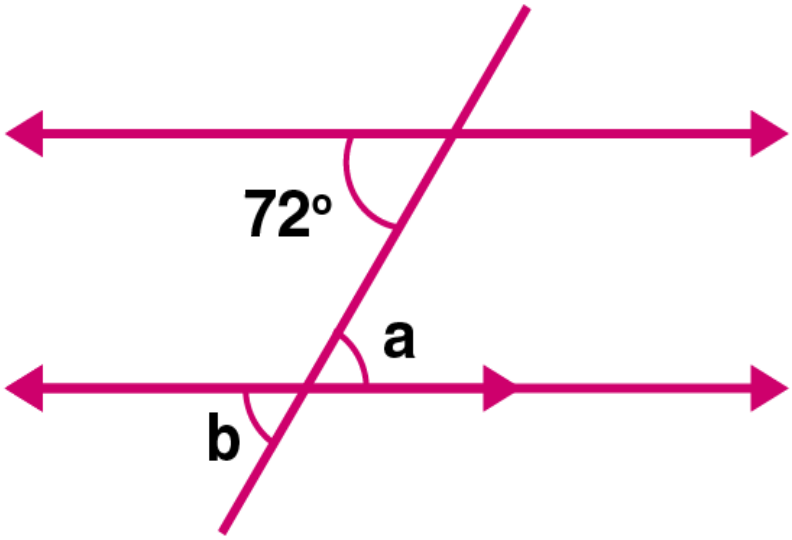

(iii)



(iv)




(v)




**Solution:**

(i) $a + 140^0 = 180^0$ [Linear pair]

$a = 180^0 - 140^0$

We get,

$a = 40^0$

Here, $b = a$ {alternate angles}

Hence, $a = b = 40^0$

(ii) Given

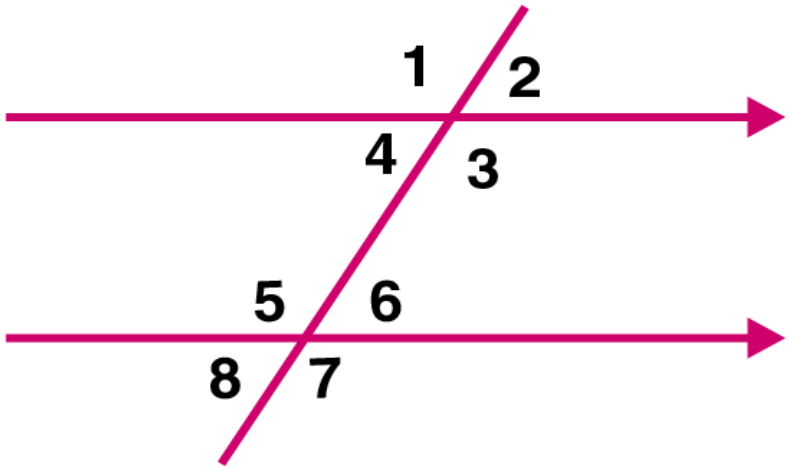
l || m and p intersects them

$b + 60^0 = 180^0$ [Linear pair]

$b = 180^0 - 60^0$

We get,
$b = 120^0$
and $a = 60^0$ {corresponding angles}
Hence, $a = 60^0$
$b = 120^0$
(iii) $a = 110^0$ [Vertically opposite angles]
$b = 180^0 - a$ [Co-interior angles]
$= 180^0 - a$
$= 180^0 - 110^0$
We get,
$= 70^0$
(iv) $a = 60^0$ [Alternate interior angles]
$b = 180^0 - a$ [Co-interior angles]
$= 180^0 - 60^0$
We get,
$= 120^0$
(v) $a = 72^0$ [Alternate interior angles]
$b = a$ [Vertically opposite angles]
Hence, $b = 72^0$

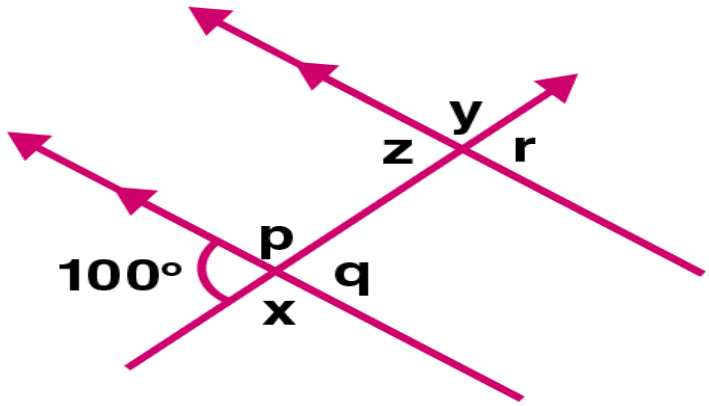
**3. If $\angle 1 = 120^0$, find the measures of: $\angle 2$, $\angle 3$, $\angle 4$, $\angle 5$, $\angle 6$, $\angle 7$ and $\angle 8$. Give reasons.**




**Solution:**
Given
l || m and p is their transversal and
$\angle 1 = 120^0$
$\angle 1 + \angle 2 = 180^0$ [Straight line angle]
$120^0 + \angle 2 = 180^0$
$\angle 2 = 180^0 - 120^0$

We get,
$\angle 2 = 60^0$
Therefore, $\angle 2 = 60^0$
But $\angle 1$ and $\angle 3$ [Vertically opposite angles]
Hence, $\angle 3 = \angle 1 = 120^0$
Similarly,
$\angle 4 = \angle 2$ [Vertically opposite angles]
$\angle 4 = 60^0$
$\angle 5 = \angle 1$ [Corresponding angles]
Hence, $\angle 5 = 120^0$
Similarly,
$\angle 6 = \angle 2$ [Corresponding angles]
$\angle 6 = 60^0$
$\angle 7 = \angle 5$ [Vertically opposite angles]
Hence, $\angle 7 = 120^0$
and $\angle 8 = \angle 6$ [Vertically opposite angles]
Hence, $\angle 8 = 60^0$
Therefore, the measures of angles are,
$\angle 2 = 60^0$
$\angle 3 = 120^0$
$\angle 4 = 60^0$
$\angle 5 = 120^0$
$\angle 6 = 60^0$
$\angle 7 = 120^0$ and
$\angle 8 = 60^0$

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



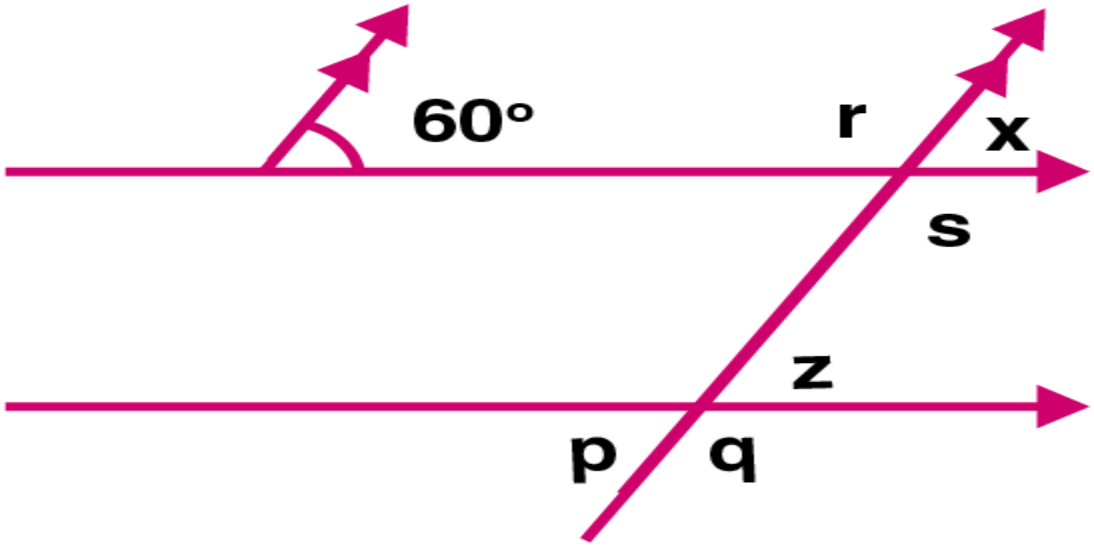
**Solution:**

$x = 180^0 - 100^0$ (Linear pair of angles)
$x = 80^0$
$y = x$ (Alternate exterior angles)
$y = 80^0$
$z = 100^0$ (Corresponding angles)
$p = x$ (Vertically opposite angles)
$p = 80^0$
$q = 100^0$ (Vertically opposite angles)
$r = q$ (Corresponding angles)
$r = 100^0$

Therefore, the measures of angles are,
$x = y = p = 80^0$
$q = r = z = 100^0$

**5. Using the given figure, fill in the blanks.**

**∠x = ……;**
**∠z = ……;**
**∠p = ……;**
**∠q = ……;**
**∠r = ……;**
**∠s = ……;**

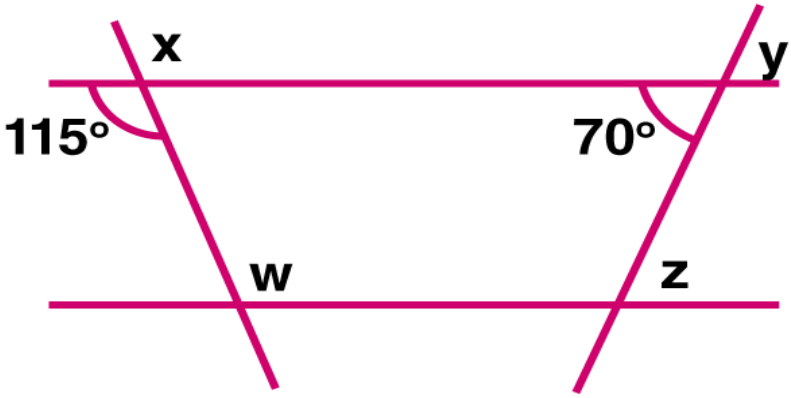



**Solutions:**

$\angle x = 60^0$ (Corresponding angles)
$z = x$ (Corresponding angles)
$= 60^0$

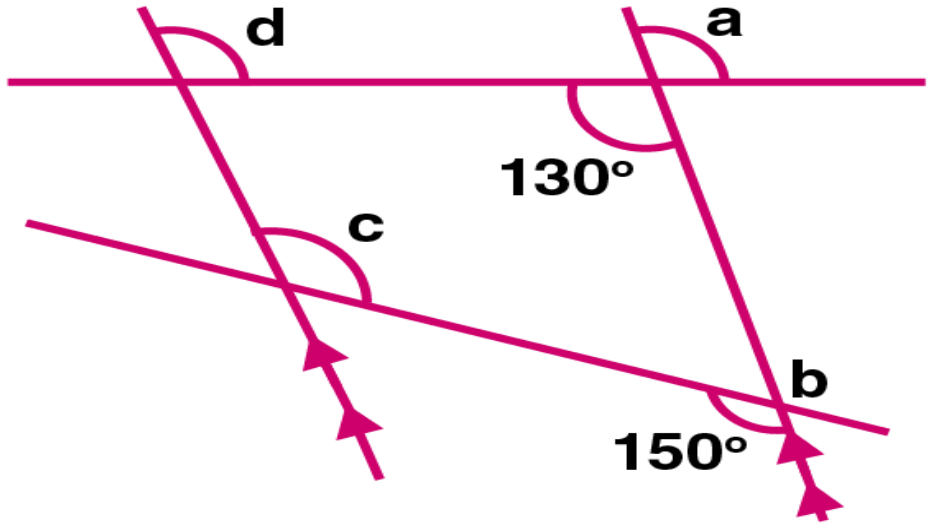
p = z (Vertically opposite angles)
$= 60^0$
$q = 180^0 – p$ (Linear pair of angles)
$= 180^0 - 60^0$
We get,
$= 120^0$
$r = 180^0 – x$ (Linear pair of angles)
$= 180^0 – 60^0$
We get,
$= 120^0$
s = r (Vertically opposite angles)
$s = r = 120^0$

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




**Solution:**
$x = 115^0$ (By vertically opposite angles)
$y = 70^0$ (By vertically opposite angles)
$z = 70^0$ (By alternate interior angles)
$w = 115^0$ (By alternate interior angles)

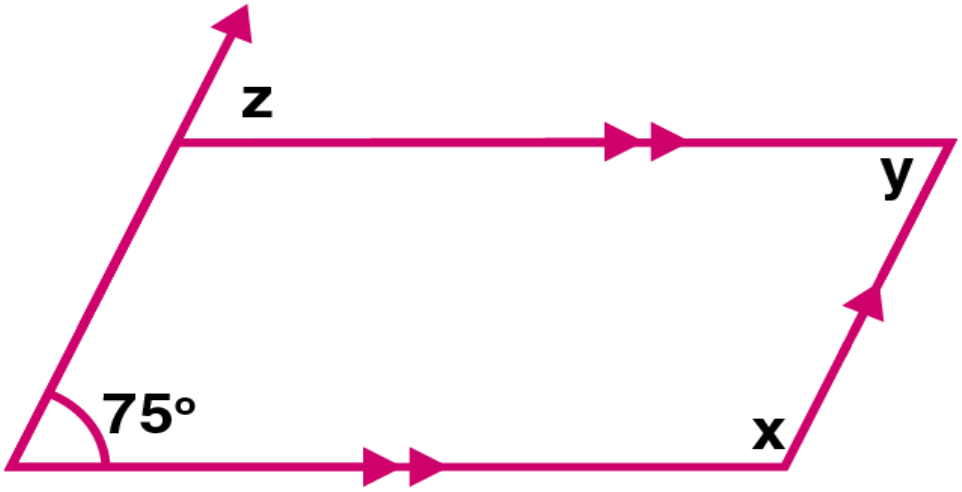
**7. Find a, b, c and d in the figure given below:**




**Solution:**

$a = 130^0$ (By vertically opposite angles)
$b = 150^0$ (By vertically opposite angles)
$c = 150^0$ (By alternate interior angles)
$d = 130^0$ (By alternate interior angles)

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




**Solution:**

$x = 180^0 - 75^0$ (Co-interior angles)
We get,
$x = 105^0$
$y = 180^0 – x$ (Co-interior angles)
$y = 180^0 – 105^0$
We get,
$y = 75^0$

$z = 75^0$ (Corresponding angles)

Therefore, the angles are,

$x = 105^0$, $y = 75^0$ and $z = 75^0$