

RD Sharma Solutions For Class 7 Maths Chapter 14 Lines And Angles

1. Write down each pair of adjacent angles shown in fig. 13.

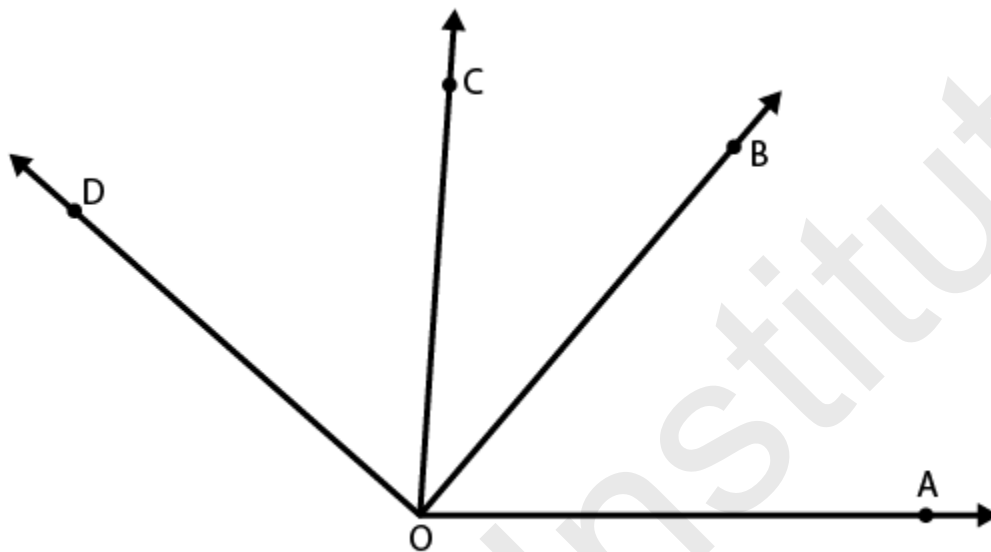


Fig 13

Solution:

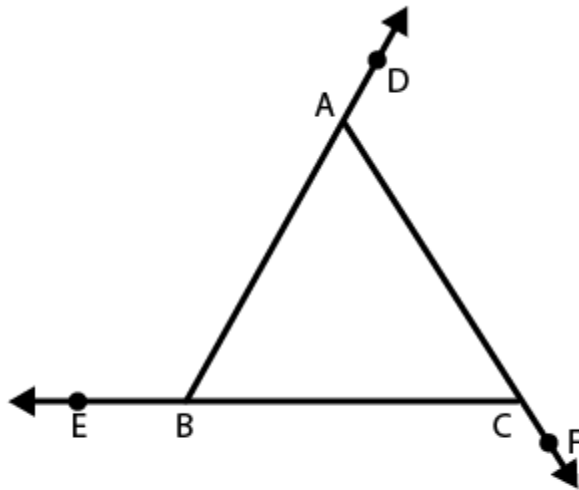
The angles that have common vertex and a common arm are known as adjacent angles

Therefore the adjacent angles in given figure are:

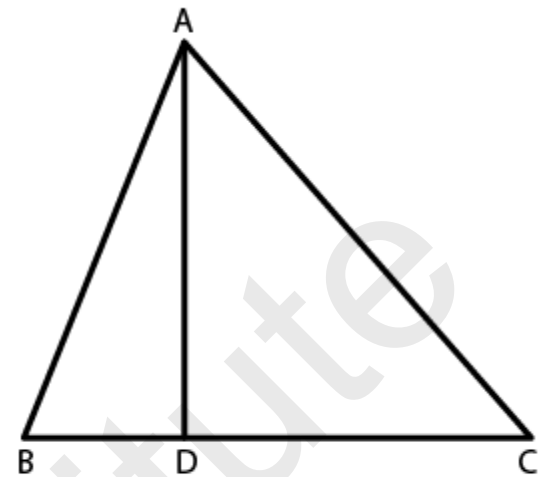
$\angle DOC$ and $\angle BOC$

$\angle COB$ and $\angle BOA$

2. In Fig. 14, name all the pairs of adjacent angles.



(i)



(ii)

Fig 14

Solution:

The angles that have common vertex and a common arm are known as adjacent angles.

In fig (i), the adjacent angles are

$\angle EBA$ and $\angle ABC$

$\angle ACB$ and $\angle BCF$

$\angle BAC$ and $\angle CAD$

In fig (ii), the adjacent angles are

$\angle BAD$ and $\angle DAC$

$\angle BDA$ and $\angle CDA$

3. In fig. 15, write down

(i) Each linear pair

(ii) Each pair of vertically opposite angles.

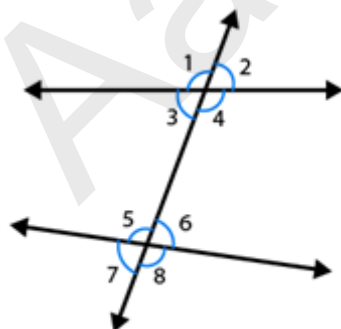


Fig 15

Solution:

(i) The two adjacent angles are said to form a linear pair of angles if their non – common arms are two opposite rays.

$\angle 1$ and $\angle 3$

$\angle 1$ and $\angle 2$

$\angle 4$ and $\angle 3$

$\angle 4$ and $\angle 2$

$\angle 5$ and $\angle 6$

$\angle 5$ and $\angle 7$

$\angle 6$ and $\angle 8$

$\angle 7$ and $\angle 8$

(ii) The two angles formed by two intersecting lines and have no common arms are called vertically opposite angles.

$\angle 1$ and $\angle 4$

$\angle 2$ and $\angle 3$

$\angle 5$ and $\angle 8$

$\angle 6$ and $\angle 7$

4. Are the angles 1 and 2 given in Fig. 16 adjacent angles?

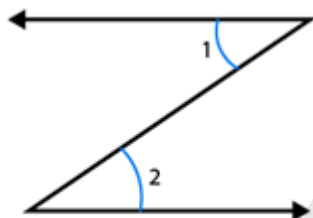


Fig 16

Solution:

No, because they don't have common vertex.

5. Find the complement of each of the following angles:

(i) 35°

(ii) 72°

(iii) 45°

(iv) 85°

Solution:

(i) The two angles are said to be complementary angles if the sum of those angles is 90°

Complementary angle for given angle is

$$90^\circ - 35^\circ = 55^\circ$$

(ii) The two angles are said to be complementary angles if the sum of those angles is 90°

Complementary angle for given angle is

$$90^\circ - 72^\circ = 18^\circ$$

(iii) The two angles are said to be complementary angles if the sum of those angles is 90°

Complementary angle for given angle is

$$90^\circ - 45^\circ = 45^\circ$$

(iv) The two angles are said to be complementary angles if the sum of those angles is 90°

Complementary angle for given angle is

$$90^\circ - 85^\circ = 5^\circ$$

6. Find the supplement of each of the following angles:

(i) 70°

(ii) 120°

(iii) 135°

(iv) 90°

Solution:

(i) The two angles are said to be supplementary angles if the sum of those angles is 180°

Therefore supplementary angle for the given angle is

$$180^\circ - 70^\circ = 110^\circ$$

(ii) The two angles are said to be supplementary angles if the sum of those angles is 180°

Therefore supplementary angle for the given angle is

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

(iii) The two angles are said to be supplementary angles if the sum of those angles is 180°

Therefore supplementary angle for the given angle is

$$180^\circ - 135^\circ = 45^\circ$$

(iv) The two angles are said to be supplementary angles if the sum of those angles is 180°

Therefore supplementary angle for the given angle is

$$180^\circ - 90^\circ = 90^\circ$$

7. Identify the complementary and supplementary pairs of angles from the following pairs:

(i) 25° , 65°

(ii) 120° , 60°

(iii) 63° , 27°

(iv) 100° , 80°

Solution:

- (i) $25^\circ + 65^\circ = 90^\circ$ so, this is a complementary pair of angle.
- (ii) $120^\circ + 60^\circ = 180^\circ$ so, this is a supplementary pair of angle.
- (iii) $63^\circ + 27^\circ = 90^\circ$ so, this is a complementary pair of angle.
- (iv) $100^\circ + 80^\circ = 180^\circ$ so, this is a supplementary pair of angle.

8. Can two obtuse angles be supplementary, if both of them be

(i) Obtuse?

(ii) Right?

(iii) Acute?

Solution:

(i) No, two obtuse angles cannot be supplementary

Because, the sum of two angles is greater than 90° so their sum will be greater than 180°

(ii) Yes, two right angles can be supplementary

Because, $90^\circ + 90^\circ = 180^\circ$

(iii) No, two acute angle cannot be supplementary

Because, the sum of two angles is less than 90° so their sum will also be less than 90°

9. Name the four pairs of supplementary angles shown in Fig.17.

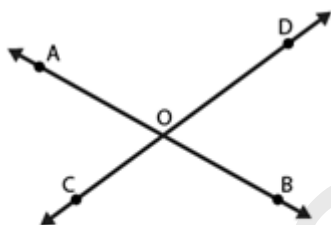


Fig 17

Solution:

The two angles are said to be supplementary angles if the sum of those angles is 180°

The supplementary angles are

$\angle AOC$ and $\angle COB$

$\angle BOC$ and $\angle DOB$

$\angle BOD$ and $\angle DOA$

$\angle AOC$ and $\angle DOA$

10. In Fig. 18, A, B, C are collinear points and $\angle DBA = \angle EBA$.

(i) Name two linear pairs.

(ii) Name two pairs of supplementary angles.

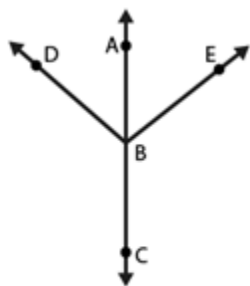


Fig 18

Solution:

(i) Two adjacent angles are said to form a linear pair of angles, if their non-common arms are two opposite rays.

Therefore linear pairs are

$\angle ABD$ and $\angle DBC$

$\angle ABE$ and $\angle EBC$

(ii) We know that every linear pair forms supplementary angles, these angles are

$\angle ABD$ and $\angle DBC$

$\angle ABE$ and $\angle EBC$

11. If two supplementary angles have equal measure, what is the measure of each angle?

Solution:

Let p and q be the two supplementary angles that are equal

The two angles are said to be supplementary angles if the sum of those angles is 180°

$$\angle p = \angle q$$

So,

$$\angle p + \angle q = 180^\circ$$

$$\angle p + \angle p = 180^\circ$$

$$2\angle p = 180^\circ$$

$$\angle p = 180^\circ/2$$

$$\angle p = 90^\circ$$

Therefore, $\angle p = \angle q = 90^\circ$

12. If the complement of an angle is 28° , then find the supplement of the angle.

Solution:

Given complement of an angle is 28°

Here, let x be the complement of the given angle 28°

Therefore, $\angle x + 28^\circ = 90^\circ$

$$\angle x = 90^\circ - 28^\circ$$

$$= 62^\circ$$

So, the supplement of the angle $= 180^\circ - 62^\circ$

$$= 118^\circ$$

13. In Fig. 19, name each linear pair and each pair of vertically opposite angles:

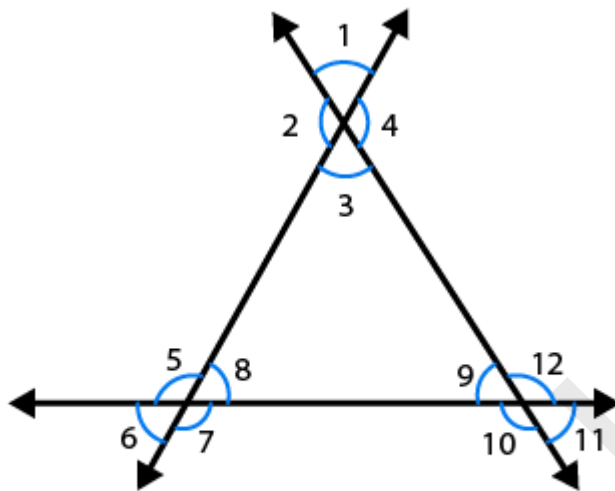


Fig 19

Solution:

Two adjacent angles are said to be linear pair of angles, if their non-common arms are two opposite rays.

Therefore linear pairs are listed below:

$\angle 1$ and $\angle 2$

$\angle 2$ and $\angle 3$

$\angle 3$ and $\angle 4$

$\angle 1$ and $\angle 4$

$\angle 5$ and $\angle 6$

$\angle 6$ and $\angle 7$

$\angle 7$ and $\angle 8$

$\angle 8$ and $\angle 5$

$\angle 9$ and $\angle 10$

$\angle 10$ and $\angle 11$

$\angle 11$ and $\angle 12$

$\angle 12$ and $\angle 9$

The two angles are said to be vertically opposite angles if the two intersecting lines have no common arms.

Therefore supplement of the angle are listed below:

$\angle 1$ and $\angle 3$

$\angle 4$ and $\angle 2$

$\angle 5$ and $\angle 7$

$\angle 6$ and $\angle 8$

$\angle 9$ and $\angle 11$

$\angle 10$ and $\angle 12$

14. In Fig. 20, OE is the bisector of $\angle BOD$. If $\angle 1 = 70^\circ$, find the magnitude of $\angle 2$, $\angle 3$ and $\angle 4$.

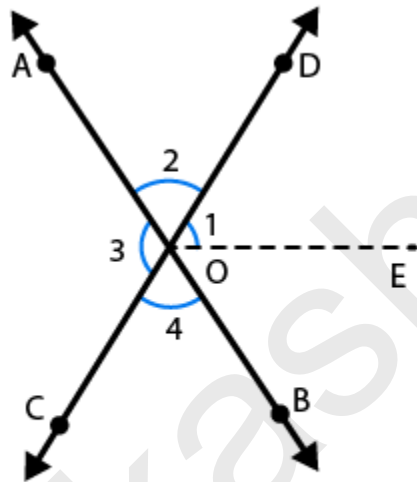


Fig 20

Solution:

Given, $\angle 1 = 70^\circ$

$$\angle 3 = 2(\angle 1)$$

$$= 2(70^\circ)$$

$$\angle 3 = 140^\circ$$

$$\angle 3 = \angle 4$$

As, OE is the angle bisector,

$$\angle DOB = 2(\angle 1)$$

$$= 2(70^\circ)$$

$$= 140^\circ$$

$$\angle DOB + \angle AOC + \angle COB + \angle AOD = 360^\circ \text{ [sum of the angle of circle} = 360^\circ]$$

$$140^\circ + 140^\circ + 2(\angle COB) = 360^\circ$$

$$\text{Since, } \angle COB = \angle AOD$$

$$2(\angle COB) = 360^\circ - 280^\circ$$

$$2(\angle COB) = 80^\circ$$

$$\angle COB = 80^\circ/2$$

$$\angle COB = 40^\circ$$

$$\text{Therefore, } \angle COB = \angle AOD = 40^\circ$$

The angles are, $\angle 1 = 70^\circ$, $\angle 2 = 40^\circ$, $\angle 3 = 140^\circ$ and $\angle 4 = 40^\circ$

15. One of the angles forming a linear pair is a right angle. What can you say about its other angle?

Solution:

Given one of the angle of a linear pair is the right angle that is 90°

We know that linear pair angle is 180°

Therefore, the other angle is

$$180^\circ - 90^\circ = 90^\circ$$

16. One of the angles forming a linear pair is an obtuse angle. What kind of angle is the other?

Solution:

Given one of the angles of a linear pair is obtuse, then the other angle should be acute, because only then their sum will be 180° .

17. One of the angles forming a linear pair is an acute angle. What kind of angle is the other?

Solution:

Given one of the Angles of a linear pair is acute, then the other angle should be obtuse, only then their sum will be 180° .

18. Can two acute angles form a linear pair?

Solution:

No, two acute angles cannot form a linear pair because their sum is always less than 180° .

19. If the supplement of an angle is 65° , then find its complement.

Solution:

Let x be the required angle

$$\text{So, } x + 65^\circ = 180^\circ$$

$$x = 180^\circ - 65^\circ$$

$$x = 115^\circ$$

The two angles are said to be complementary angles if the sum of those angles is 90° here it is more than 90° therefore the complement of the angle cannot be determined.

20. Find the value of x in each of the following figures.

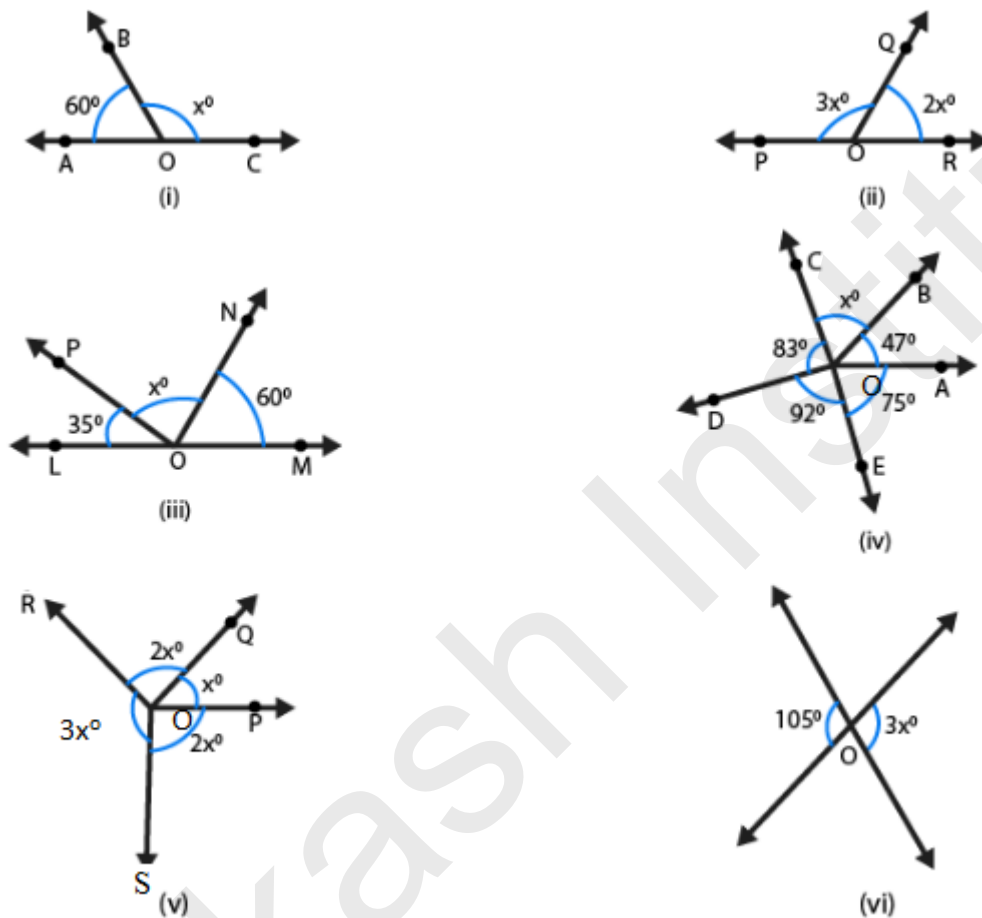


Fig 21

Solution:

(i) We know that $\angle BOA + \angle BOC = 180^\circ$

[Linear pair: The two adjacent angles are said to form a linear pair of angles if their non-common arms are two opposite rays and sum of the angle is 180°]

$$60^\circ + x^\circ = 180^\circ$$

$$x^\circ = 180^\circ - 60^\circ$$

$$x^\circ = 120^\circ$$

(ii) We know that $\angle POQ + \angle QOR = 180^\circ$

[Linear pair: The two adjacent angles are said to form a linear pair of angles if their non–common arms are two opposite rays and sum of the angle is 180°]

$$3x^\circ + 2x^\circ = 180^\circ$$

$$5x^\circ = 180^\circ$$

$$x^\circ = 180^\circ/5$$

$$x^\circ = 36^\circ$$

(iii) We know that $\angle LOP + \angle PON + \angle NOM = 180^\circ$

[Linear pair: The two adjacent angles are said to form a linear pair of angles if their non–common arms are two opposite rays and sum of the angle is 180°]

$$\text{Since, } 35^\circ + x^\circ + 60^\circ = 180^\circ$$

$$x^\circ = 180^\circ - 35^\circ - 60^\circ$$

$$x^\circ = 180^\circ - 95^\circ$$

$$x^\circ = 85^\circ$$

(iv) We know that $\angle DOC + \angle DOE + \angle EOA + \angle AOB + \angle BOC = 360^\circ$

$$83^\circ + 92^\circ + 47^\circ + 75^\circ + x^\circ = 360^\circ$$

$$x^\circ + 297^\circ = 360^\circ$$

$$x^\circ = 360^\circ - 297^\circ$$

$$x^\circ = 63^\circ$$

(v) We know that $\angle ROS + \angle ROQ + \angle QOP + \angle POS = 360^\circ$

$$3x^\circ + 2x^\circ + x^\circ + 2x^\circ = 360^\circ$$

$$8x^\circ = 360^\circ$$

$$x^\circ = 360^\circ/8$$

$$x^\circ = 45^\circ$$

(vi) Linear pair: The two adjacent angles are said to form a linear pair of angles if their non–common arms are two opposite rays and sum of the angle is 180°

$$\text{Therefore } 3x^\circ = 105^\circ$$

$$x^\circ = 105^\circ/3$$

$$x^\circ = 35^\circ$$

21. In Fig. 22, it being given that $\angle 1 = 65^\circ$, find all other angles.

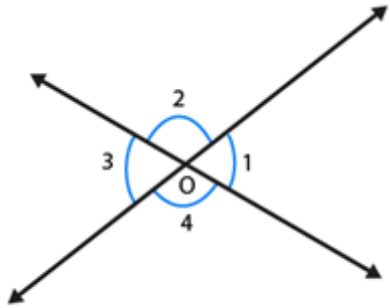


Fig 22

Solution:

Given from the figure 22, $\angle 1 = \angle 3$ are the vertically opposite angles

Therefore, $\angle 3 = 65^\circ$

Here, $\angle 1 + \angle 2 = 180^\circ$ are the linear pair [The two adjacent angles are said to form a linear pair of angles if their non-common arms are two opposite rays and sum of the angle is 180°]

Therefore, $\angle 2 = 180^\circ - 65^\circ$

$= 115^\circ$

$\angle 2 = \angle 4$ are the vertically opposite angles [from the figure]

Therefore, $\angle 2 = \angle 4 = 115^\circ$

And $\angle 3 = 65^\circ$

22. In Fig. 23, OA and OB are opposite rays:

(i) If $x = 25^\circ$, what is the value of y ?

(ii) If $y = 35^\circ$, what is the value of x ?

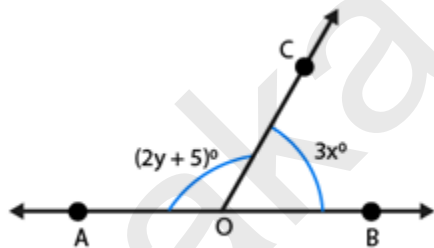


Fig 23

Solution:

(i) $\angle AOC + \angle BOC = 180^\circ$ [The two adjacent angles are said to form a linear pair of angles if their non-common arms are two opposite rays and sum of the angle is 180°]

$$2y + 5^\circ + 3x = 180^\circ$$

$$3x + 2y = 175^\circ$$

Given If $x = 25^\circ$, then

$$3(25^\circ) + 2y = 175^\circ$$

$$75^\circ + 2y = 175^\circ$$

$$2y = 175^\circ - 75^\circ$$

$$2y = 100^\circ$$

$$y = 100^\circ/2$$

$$y = 50^\circ$$

(ii) $\angle AOC + \angle BOC = 180^\circ$ [The two adjacent angles are said to form a linear pair of angles if their non-common arms are two opposite rays and sum of the angle is 180°]

$$2y + 5 + 3x = 180^\circ$$

$$3x + 2y = 175^\circ$$

Given If $y = 35^\circ$, then

$$3x + 2(35^\circ) = 175^\circ$$

$$3x + 70^\circ = 175^\circ$$

$$3x = 175^\circ - 70^\circ$$

$$3x = 105^\circ$$

$$x = 105^\circ/3$$

$$x = 35^\circ$$

23. In Fig. 24, write all pairs of adjacent angles and all the liner pairs.

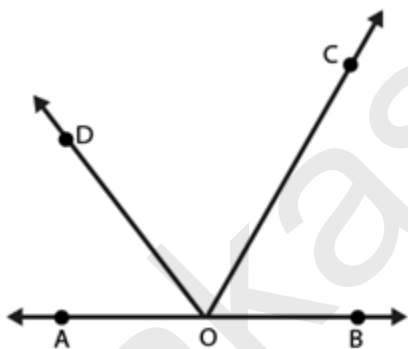


Fig 24

Solution:

Pairs of adjacent angles are:

$\angle DOA$ and $\angle DOC$

$\angle BOC$ and $\angle COD$

$\angle AOD$ and $\angle BOD$

$\angle AOC$ and $\angle BOC$

Linear pairs: [The two adjacent angles are said to form a linear pair of angles if their non-common arms are two opposite rays and sum of the angle is 180°]

$\angle AOD$ and $\angle BOD$

$\angle AOC$ and $\angle BOC$

24. In Fig. 25, find $\angle x$. Further find $\angle BOC$, $\angle COD$ and $\angle AOD$.

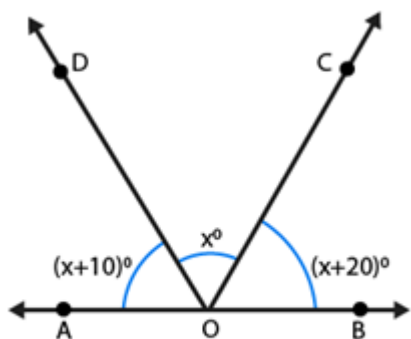


Fig 25

Solution:

$$(x + 10)^\circ + x^\circ + (x + 20)^\circ = 180^\circ [\text{linear pair}]$$

On rearranging we get

$$3x^\circ + 30^\circ = 180^\circ$$

$$3x^\circ = 180^\circ - 30^\circ$$

$$3x^\circ = 150^\circ$$

$$x^\circ = 150^\circ / 3$$

$$x^\circ = 50^\circ$$

Also given that

$$\angle BOC = (x + 20)^\circ$$

$$= (50 + 20)^\circ$$

$$= 70^\circ$$

$$\angle COD = 50^\circ$$

$$\angle AOD = (x + 10)^\circ$$

$$= (50 + 10)^\circ$$

$$= 60^\circ$$

25. How many pairs of adjacent angles are formed when two lines intersect in a point?

Solution:

If the two lines intersect at a point, then four adjacent pairs are formed and those are linear.

26. How many pairs of adjacent angles, in all, can you name in Fig. 26?

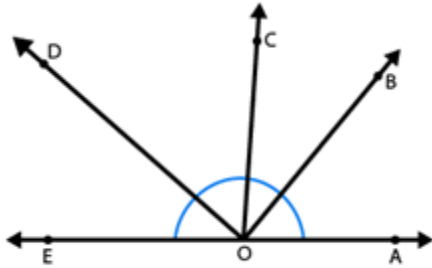


Fig 26

Solution:

There are 10 adjacent pairs formed in the given figure, they are

$\angle EOD$ and $\angle DOC$

$\angle COD$ and $\angle BOC$

$\angle COB$ and $\angle BOA$

$\angle AOB$ and $\angle BOD$

$\angle BOC$ and $\angle COE$

$\angle COD$ and $\angle COA$

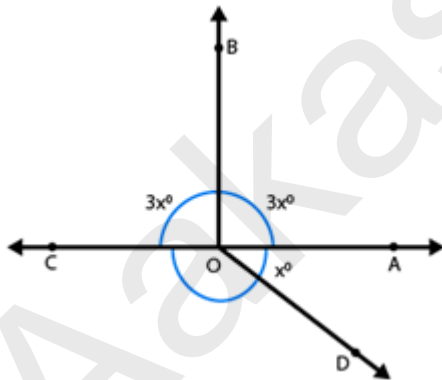
$\angle DOE$ and $\angle DOB$

$\angle EOD$ and $\angle DOA$

$\angle EOC$ and $\angle AOC$

$\angle AOB$ and $\angle BOE$

27. In Fig. 27, determine the value of x .



Solution:

From the figure we can write as $\angle COB + \angle AOB = 180^\circ$ [linear pair]

$$3x^\circ + 3x^\circ = 180^\circ$$

$$6x^\circ = 180^\circ$$

$$x^\circ = 180^\circ/6$$

$$x^\circ = 30^\circ$$

28. In Fig.28, AOC is a line, find x.

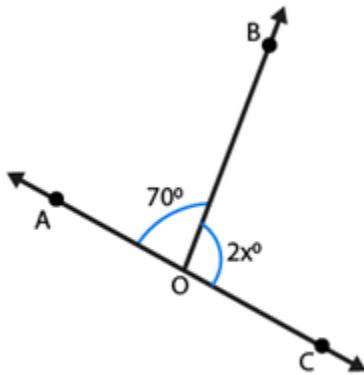


Fig 28

Solution:

From the figure we can write as

$$\angle AOB + \angle BOC = 180^\circ \text{ [linear pair]}$$

Linear pair

$$2x + 70^\circ = 180^\circ$$

$$2x = 180^\circ - 70^\circ$$

$$2x = 110^\circ$$

$$x = 110^\circ/2$$

$$x = 55^\circ$$

29. In Fig. 29, POS is a line, find x.

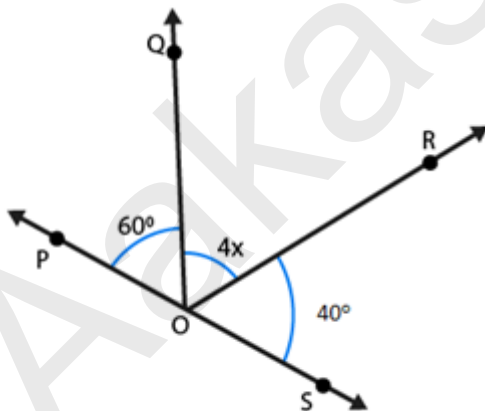


Fig 29

Solution:

From the figure we can write as angles of a straight line,

$$\angle QOP + \angle QOR + \angle ROS = 180^\circ$$

$$60^\circ + 4x + 40^\circ = 180^\circ$$

On rearranging we get, $100^\circ + 4x = 180^\circ$

$$4x = 180^\circ - 100^\circ$$

$$4x = 80^\circ$$

$$x = 80^\circ/4$$

$$x = 20^\circ$$

30. In Fig. 30, lines l_1 and l_2 intersect at O, forming angles as shown in the figure. If $x = 45^\circ$, find the values of y , z and u .

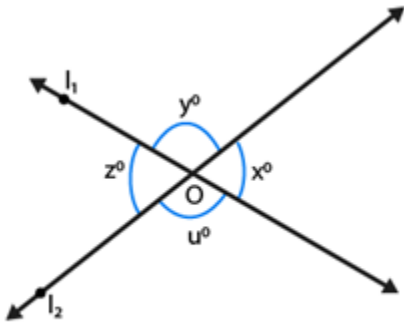


Fig 30

Solution:

Given that, $\angle x = 45^\circ$

From the figure we can write as

$$\angle x = \angle z = 45^\circ$$

Also from the figure, we have

$$\angle y = \angle u$$

From the property of linear pair we can write as

$$\angle x + \angle y + \angle z + \angle u = 360^\circ$$

$$45^\circ + 45^\circ + \angle y + \angle u = 360^\circ$$

$$90^\circ + \angle y + \angle u = 360^\circ$$

$$\angle y + \angle u = 360^\circ - 90^\circ$$

$$\angle y + \angle u = 270^\circ \text{ (vertically opposite angles } \angle y = \angle u)$$

$$2\angle y = 270^\circ$$

$$\angle y = 135^\circ$$

Therefore, $\angle y = \angle u = 135^\circ$

So, $\angle x = 45^\circ$, $\angle y = 135^\circ$, $\angle z = 45^\circ$ and $\angle u = 135^\circ$

31. In Fig. 31, three coplanar lines intersect at a point O, forming angles as shown in the figure. Find the values of x , y , z and u

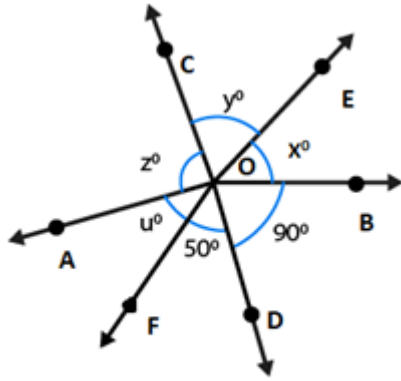


Fig 31

Solution:

Given that, $\angle x + \angle y + \angle z + \angle u + 50^\circ + 90^\circ = 360^\circ$

Linear pair, $\angle x + 50^\circ + 90^\circ = 180^\circ$

$$\angle x + 140^\circ = 180^\circ$$

On rearranging we get

$$\angle x = 180^\circ - 140^\circ$$

$$\angle x = 40^\circ$$

From the figure we can write as

$\angle x = \angle u = 40^\circ$ are vertically opposite angles

$\angle z = 90^\circ$ is a vertically opposite angle

$\angle y = 50^\circ$ is a vertically opposite angle

Therefore, $\angle x = 40^\circ$, $\angle y = 50^\circ$, $\angle z = 90^\circ$ and $\angle u = 40^\circ$

32. In Fig. 32, find the values of x, y and z.

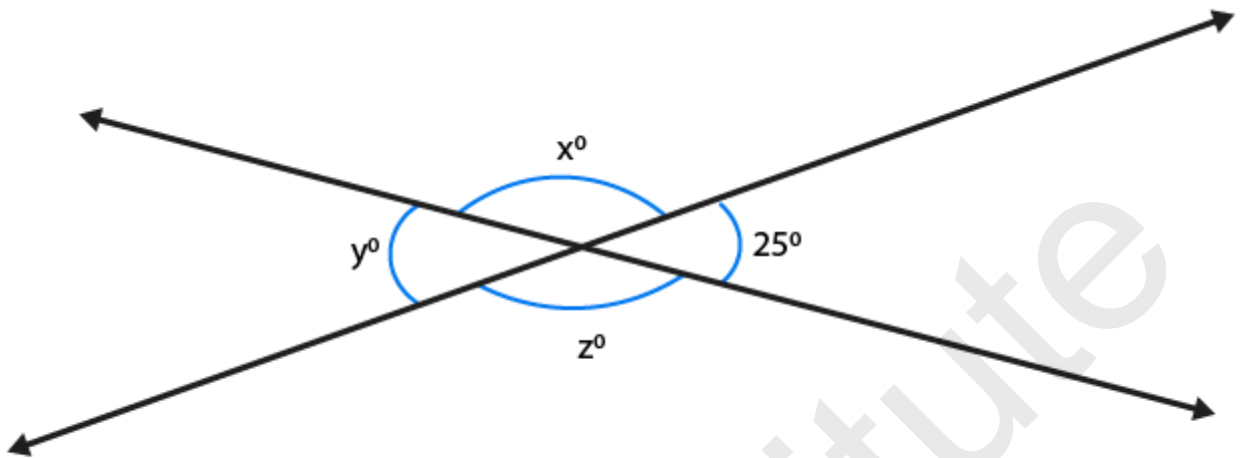


Fig 32

Solution:

$\angle y = 25^\circ$ vertically opposite angle

From the figure we can write as

$\angle x = \angle z$ are vertically opposite angles

$$\angle x + \angle y + \angle z + 25^\circ = 360^\circ$$

$$\angle x + \angle z + 25^\circ + 25^\circ = 360^\circ$$

On rearranging we get,

$$\angle x + \angle z + 50^\circ = 360^\circ$$

$$\angle x + \angle z = 360^\circ - 50^\circ \quad [\angle x = \angle z]$$

$$2\angle x = 310^\circ$$

$$\angle x = 155^\circ$$

$$\text{And, } \angle x = \angle z = 155^\circ$$

Therefore, $\angle x = 155^\circ$, $\angle y = 25^\circ$ and $\angle z = 155^\circ$

Exercise 14.2 Page No: 14.20

1. In Fig. 58, line n is a transversal to line l and m. Identify the following:

(i) Alternate and corresponding angles in Fig. 58 (i)

(ii) Angles alternate to $\angle d$ and $\angle g$ and angles corresponding to $\angle f$ and $\angle h$ in Fig. 58 (ii)

(iii) Angle alternate to $\angle PQR$, angle corresponding to $\angle RQF$ and angle alternate to $\angle PQE$ in Fig. 58 (iii)

(iv) Pairs of interior and exterior angles on the same side of the transversal in Fig. 58 (ii)

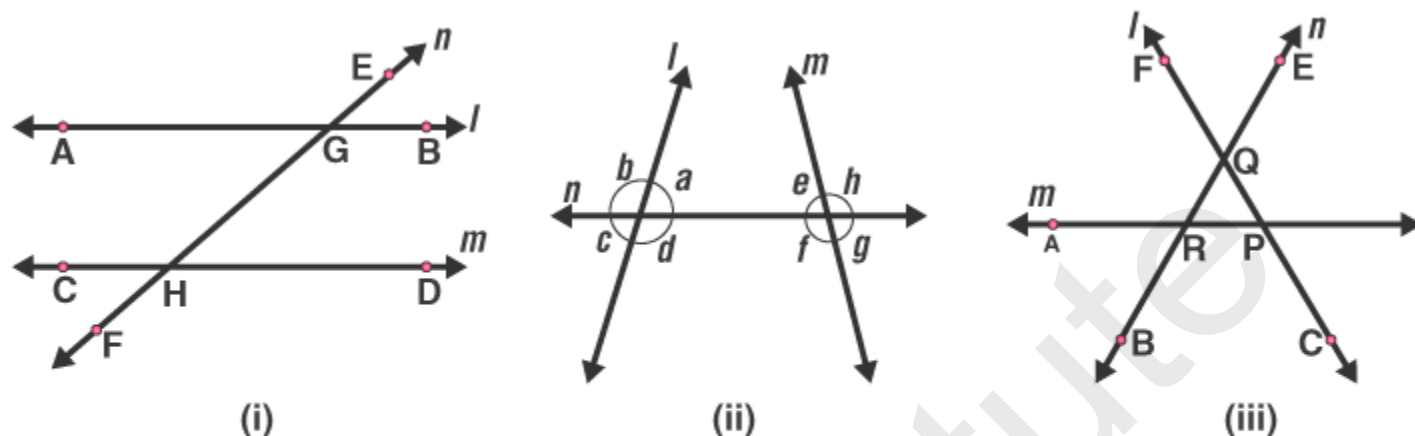


Fig.58

Solution:

(i) A pair of angles in which one arm of both the angles is on the same side of the transversal and their other arms are directed in the same sense is called a pair of corresponding angles.

In Figure (i) Corresponding angles are

$\angle EGB$ and $\angle GHD$

$\angle HGB$ and $\angle FHD$

$\angle EGA$ and $\angle GHC$

$\angle AGH$ and $\angle CHF$

A pair of angles in which one arm of each of the angle is on opposite sides of the transversal and whose other arms include the one segment is called a pair of alternate angles.

The alternate angles are:

$\angle EGB$ and $\angle CHF$

$\angle HGB$ and $\angle CHG$

$\angle EGA$ and $\angle FHD$

$\angle AGH$ and $\angle GHD$

(ii) In Figure (ii)

The alternate angle to $\angle d$ is $\angle e$.

The alternate angle to $\angle g$ is $\angle b$.

The corresponding angle to $\angle f$ is $\angle c$.

The corresponding angle to $\angle h$ is $\angle a$.

(iii) In Figure (iii)

Angle alternate to $\angle PQR$ is $\angle QRA$.

Angle corresponding to $\angle RQF$ is $\angle ARB$.

Angle alternate to $\angle POE$ is $\angle ARB$.

(iv) In Figure (ii)

Pair of interior angles are

$\angle a$ is $\angle e$.

$\angle d$ is $\angle f$.

Pair of exterior angles are

$\angle b$ is $\angle h$.

$\angle c$ is $\angle g$.

2. In Fig. 59, AB and CD are parallel lines intersected by a transversal PQ at L and M respectively, If $\angle CMQ = 60^\circ$, find all other angles in the figure.

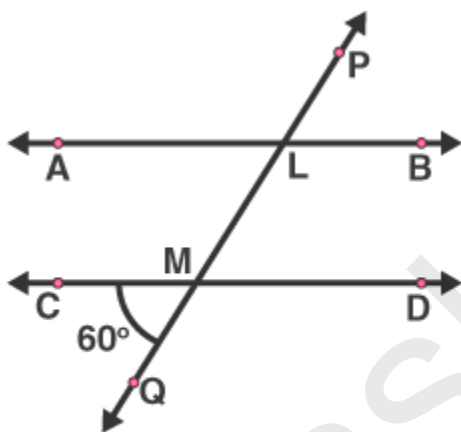


Fig. 59

Solution:

A pair of angles in which one arm of both the angles is on the same side of the transversal and their other arms are directed in the same sense is called a pair of corresponding angles.

Therefore corresponding angles are

$$\angle ALM = \angle CMQ = 60^\circ \text{ [given]}$$

Vertically opposite angles are

$$\angle LMD = \angle CMQ = 60^\circ \text{ [given]}$$

Vertically opposite angles are

$$\angle ALM = \angle PLB = 60^\circ$$

Here, $\angle CMQ + \angle QMD = 180^\circ$ are the linear pair

On rearranging we get

$$\angle QMD = 180^\circ - 60^\circ$$

$$= 120^\circ$$

Corresponding angles are

$$\angle QMD = \angle MLB = 120^\circ$$

Vertically opposite angles

$$\angle QMD = \angle CML = 120^\circ$$

Vertically opposite angles

$$\angle MLB = \angle ALP = 120^\circ$$

3. In Fig. 60, AB and CD are parallel lines intersected by a transversal by a transversal PQ at L and M respectively. If $\angle LMD = 35^\circ$ find $\angle ALM$ and $\angle PLA$.

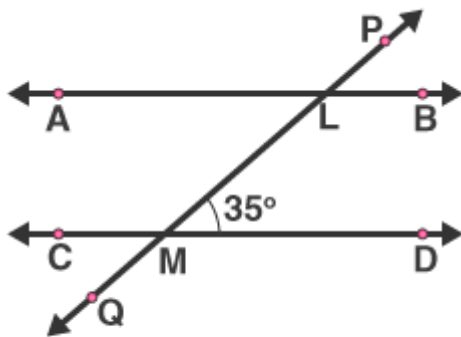


Fig. 60

Solution:

Given that, $\angle LMD = 35^\circ$

From the figure we can write

$\angle LMD$ and $\angle LMC$ is a linear pair

$$\angle LMD + \angle LMC = 180^\circ \text{ [sum of angles in linear pair} = 180^\circ \text{]}$$

On rearranging, we get

$$\angle LMC = 180^\circ - 35^\circ$$

$$= 145^\circ$$

$$\text{So, } \angle LMC = \angle PLA = 145^\circ$$

$$\text{And, } \angle LMC = \angle MLB = 145^\circ$$

$\angle MLB$ and $\angle ALM$ is a linear pair

$$\angle MLB + \angle ALM = 180^\circ \text{ [sum of angles in linear pair} = 180^\circ \text{]}$$

$$\angle ALM = 180^\circ - 145^\circ$$

$$\angle ALM = 35^\circ$$

Therefore, $\angle ALM = 35^\circ$, $\angle PLA = 145^\circ$.

4. The line n is transversal to line l and m in Fig. 61. Identify the angle alternate to $\angle 13$, angle corresponding to $\angle 15$, and angle alternate to $\angle 15$.

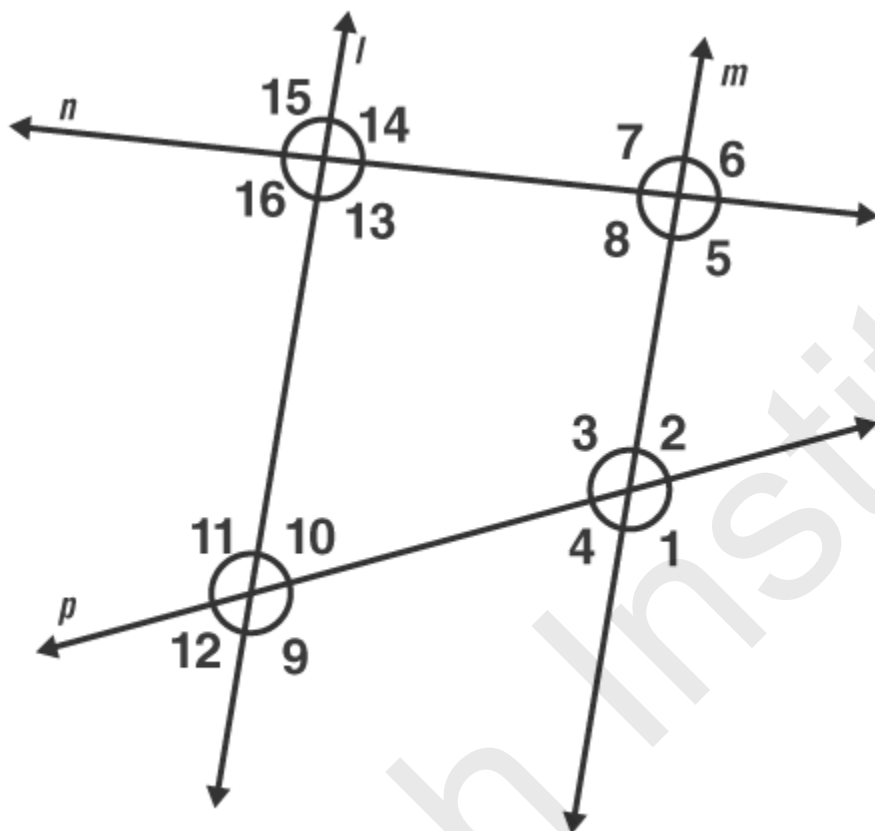


Fig.61

Solution:

Given that, $l \parallel m$

From the figure the angle alternate to $\angle 13$ is $\angle 7$

From the figure the angle corresponding to $\angle 15$ is $\angle 7$ [A pair of angles in which one arm of both the angles is on the same side of the transversal and their other arms are directed in the same sense is called a pair of corresponding angles.]

Again from the figure angle alternate to $\angle 15$ is $\angle 5$

5. In Fig. 62, line $l \parallel m$ and n is transversal. If $\angle 1 = 40^\circ$, find all the angles and check that all corresponding angles and alternate angles are equal.

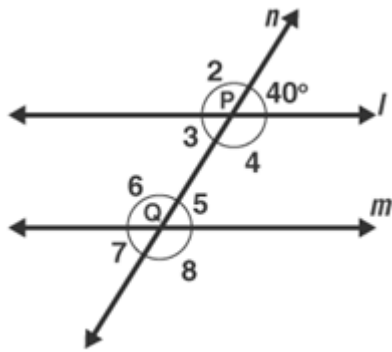


Fig. 62

Solution:

Given that, $\angle 1 = 40^\circ$

$\angle 1$ and $\angle 2$ is a linear pair [from the figure]

$$\angle 1 + \angle 2 = 180^\circ$$

$$\angle 2 = 180^\circ - 40^\circ$$

$$\angle 2 = 140^\circ$$

Again from the figure we can say that

$\angle 2$ and $\angle 6$ is a corresponding angle pair

$$\text{So, } \angle 6 = 140^\circ$$

$\angle 6$ and $\angle 5$ is a linear pair [from the figure]

$$\angle 6 + \angle 5 = 180^\circ$$

$$\angle 5 = 180^\circ - 140^\circ$$

$$\angle 5 = 40^\circ$$

From the figure we can write as

$\angle 3$ and $\angle 5$ are alternate interior angles

$$\text{So, } \angle 5 = \angle 3 = 40^\circ$$

$\angle 3$ and $\angle 4$ is a linear pair

$$\angle 3 + \angle 4 = 180^\circ$$

$$\angle 4 = 180^\circ - 40^\circ$$

$$\angle 4 = 140^\circ$$

Now, $\angle 4$ and $\angle 6$ are a pair of interior angles

$$\text{So, } \angle 4 = \angle 6 = 140^\circ$$

$\angle 3$ and $\angle 7$ are a pair of corresponding angles

$$\text{So, } \angle 3 = \angle 7 = 40^\circ$$

Therefore, $\angle 7 = 40^\circ$

$\angle 4$ and $\angle 8$ are a pair of corresponding angles

So, $\angle 4 = \angle 8 = 140^\circ$

Therefore, $\angle 8 = 140^\circ$

Therefore, $\angle 1 = 40^\circ$, $\angle 2 = 140^\circ$, $\angle 3 = 40^\circ$, $\angle 4 = 140^\circ$, $\angle 5 = 40^\circ$, $\angle 6 = 140^\circ$, $\angle 7 = 40^\circ$ and $\angle 8 = 140^\circ$

6. In Fig.63, line $l \parallel m$ and a transversal n cuts them P and Q respectively. If $\angle 1 = 75^\circ$, find all other angles.

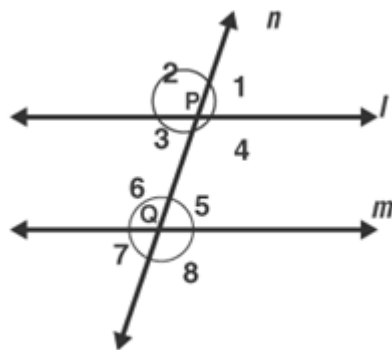


Fig. 63

Solution:

Given that, $l \parallel m$ and $\angle 1 = 75^\circ$

$\angle 1 = \angle 3$ are vertically opposite angles

We know that, from the figure

$\angle 1 + \angle 2 = 180^\circ$ is a linear pair

$\angle 2 = 180^\circ - 75^\circ$

$\angle 2 = 105^\circ$

Here, $\angle 1 = \angle 5 = 75^\circ$ are corresponding angles

$\angle 5 = \angle 7 = 75^\circ$ are vertically opposite angles.

$\angle 2 = \angle 6 = 105^\circ$ are corresponding angles

$\angle 6 = \angle 8 = 105^\circ$ are vertically opposite angles

$\angle 2 = \angle 4 = 105^\circ$ are vertically opposite angles

So, $\angle 1 = 75^\circ$, $\angle 2 = 105^\circ$, $\angle 3 = 75^\circ$, $\angle 4 = 105^\circ$, $\angle 5 = 75^\circ$, $\angle 6 = 105^\circ$, $\angle 7 = 75^\circ$ and $\angle 8 = 105^\circ$

7. In Fig. 64, $AB \parallel CD$ and a transversal PQ cuts at L and M respectively. If $\angle QMD = 100^\circ$, find all the other angles.

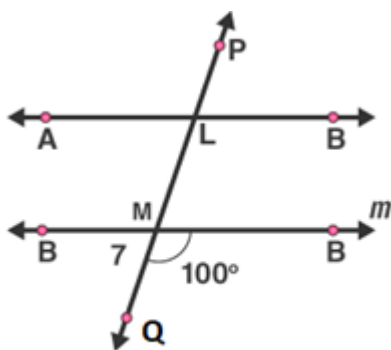


Fig. 64

Solution:

Given that, $AB \parallel CD$ and $\angle QMD = 100^\circ$

We know that, from the figure $\angle QMD + \angle QMC = 180^\circ$ is a linear pair,

$$\angle QMC = 180^\circ - \angle QMD$$

$$\angle QMC = 180^\circ - 100^\circ$$

$$\angle QMC = 80^\circ$$

Corresponding angles are

$$\angle DMQ = \angle BLM = 100^\circ$$

$$\angle CMQ = \angle ALM = 80^\circ$$

Vertically Opposite angles are

$$\angle DMQ = \angle CML = 100^\circ$$

$$\angle BLM = \angle PLA = 100^\circ$$

$$\angle CMQ = \angle DML = 80^\circ$$

$$\angle ALM = \angle PLB = 80^\circ$$

8. In Fig. 65, $l \parallel m$ and $p \parallel q$. Find the values of x , y , z , t .

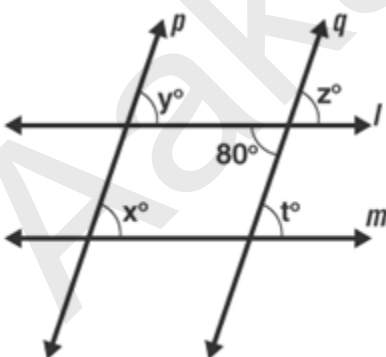


Fig. 65

Solution:

Given that one of the angle is 80°

$\angle z$ and 80° are vertically opposite angles

Therefore $\angle z = 80^\circ$

$\angle z$ and $\angle t$ are corresponding angles

$\angle z = \angle t$

Therefore, $\angle t = 80^\circ$

$\angle z$ and $\angle y$ are corresponding angles

$\angle z = \angle y$

Therefore, $\angle y = 80^\circ$

$\angle x$ and $\angle y$ are corresponding angles

$\angle y = \angle x$

Therefore, $\angle x = 80^\circ$

9. In Fig. 66, line $l \parallel m$, $\angle 1 = 120^\circ$ and $\angle 2 = 100^\circ$, find out $\angle 3$ and $\angle 4$.

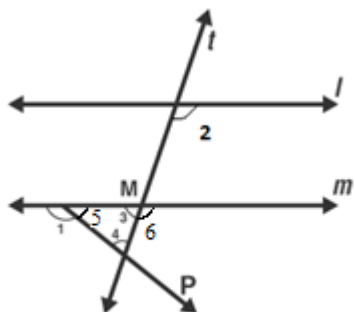


Fig. 66

Solution:

Given that, $\angle 1 = 120^\circ$ and $\angle 2 = 100^\circ$

From the figure $\angle 1$ and $\angle 5$ is a linear pair

$$\angle 1 + \angle 5 = 180^\circ$$

$$\angle 5 = 180^\circ - 120^\circ$$

$$\angle 5 = 60^\circ$$

Therefore, $\angle 5 = 60^\circ$

$\angle 2$ and $\angle 6$ are corresponding angles

$$\angle 2 = \angle 6 = 100^\circ$$

Therefore, $\angle 6 = 100^\circ$

$\angle 6$ and $\angle 3$ a linear pair

$$\angle 6 + \angle 3 = 180^\circ$$

$$\angle 3 = 180^\circ - 100^\circ$$

$$\angle 3 = 80^\circ$$

Therefore, $\angle 3 = 80^\circ$

By, angles of sum property

$$\angle 3 + \angle 5 + \angle 4 = 180^\circ$$

$$\angle 4 = 180^\circ - 80^\circ - 60^\circ$$

$$\angle 4 = 40^\circ$$

Therefore, $\angle 4 = 40^\circ$

10. In Fig. 67, $l \parallel m$. Find the values of a , b , c , d . Give reasons.

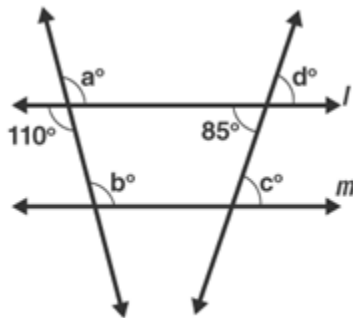


Fig. 67

Solution:

Given $l \parallel m$

From the figure vertically opposite angles,

$$\angle a = 110^\circ$$

Corresponding angles, $\angle a = \angle b$

Therefore, $\angle b = 110^\circ$

Vertically opposite angle,

$$\angle d = 85^\circ$$

Corresponding angles, $\angle d = \angle c$

Therefore, $\angle c = 85^\circ$

Hence, $\angle a = 110^\circ$, $\angle b = 110^\circ$, $\angle c = 85^\circ$, $\angle d = 85^\circ$

11. In Fig. 68, $AB \parallel CD$ and $\angle 1$ and $\angle 2$ are in the ratio of 3: 2. Determine all angles from 1 to 8.

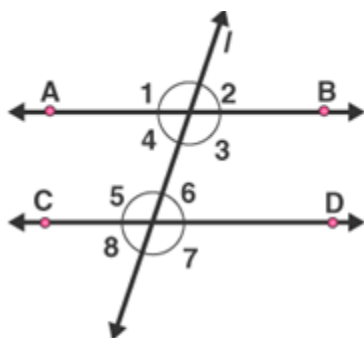


Fig. 68

Solution:

Given $\angle 1$ and $\angle 2$ are in the ratio 3: 2

Let us take the angles as $3x, 2x$

$\angle 1$ and $\angle 2$ are linear pair [from the figure]

$$3x + 2x = 180^\circ$$

$$5x = 180^\circ$$

$$x = 180^\circ/5$$

$$x = 36^\circ$$

$$\text{Therefore, } \angle 1 = 3x = 3(36) = 108^\circ$$

$$\angle 2 = 2x = 2(36) = 72^\circ$$

$\angle 1$ and $\angle 5$ are corresponding angles

$$\text{Therefore } \angle 1 = \angle 5$$

$$\text{Hence, } \angle 5 = 108^\circ$$

$\angle 2$ and $\angle 6$ are corresponding angles

$$\text{So } \angle 2 = \angle 6$$

$$\text{Therefore, } \angle 6 = 72^\circ$$

$\angle 4$ and $\angle 6$ are alternate pair of angles

$$\angle 4 = \angle 6 = 72^\circ$$

$$\text{Therefore, } \angle 4 = 72^\circ$$

$\angle 3$ and $\angle 5$ are alternate pair of angles

$$\angle 3 = \angle 5 = 108^\circ$$

$$\text{Therefore, } \angle 3 = 108^\circ$$

$\angle 2$ and $\angle 8$ are alternate exterior of angles

$$\angle 2 = \angle 8 = 72^\circ$$

Therefore, $\angle 8 = 72^\circ$

$\angle 1$ and $\angle 7$ are alternate exterior of angles

$$\angle 1 = \angle 7 = 108^\circ$$

Therefore, $\angle 7 = 108^\circ$

Hence, $\angle 1 = 108^\circ$, $\angle 2 = 72^\circ$, $\angle 3 = 108^\circ$, $\angle 4 = 72^\circ$, $\angle 5 = 108^\circ$, $\angle 6 = 72^\circ$, $\angle 7 = 108^\circ$, $\angle 8 = 72^\circ$

12. In Fig. 69, l, m and n are parallel lines intersected by transversal p at X, Y and Z respectively. Find $\angle 1$, $\angle 2$ and $\angle 3$.

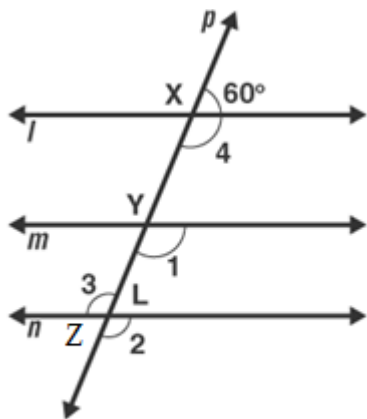


Fig. 69

Solution:

Given l, m and n are parallel lines intersected by transversal p at X, Y and Z

Therefore linear pair,

$$\angle 4 + 60^\circ = 180^\circ$$

$$\angle 4 = 180^\circ - 60^\circ$$

$$\angle 4 = 120^\circ$$

From the figure,

$\angle 4$ and $\angle 1$ are corresponding angles

$$\angle 4 = \angle 1$$

Therefore, $\angle 1 = 120^\circ$

$\angle 1$ and $\angle 2$ are corresponding angles

$$\angle 2 = \angle 1$$

Therefore, $\angle 2 = 120^\circ$

$\angle 2$ and $\angle 3$ are vertically opposite angles

$$\angle 2 = \angle 3$$

Therefore, $\angle 3 = 120^\circ$

13. In Fig. 70, if $l \parallel m \parallel n$ and $\angle 1 = 60^\circ$, find $\angle 2$

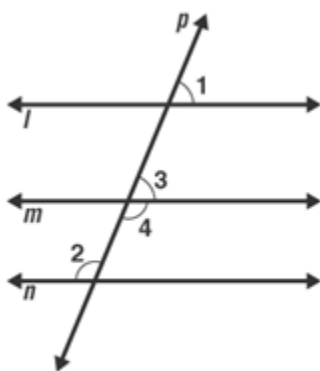


Fig. 70

Solution:

Given that $l \parallel m \parallel n$

From the figure Corresponding angles are

$$\angle 1 = \angle 3$$

$$\angle 1 = 60^\circ$$

$$\text{Therefore, } \angle 3 = 60^\circ$$

$\angle 3$ and $\angle 4$ are linear pair

$$\angle 3 + \angle 4 = 180^\circ$$

$$\angle 4 = 180^\circ - 60^\circ$$

$$\angle 4 = 120^\circ$$

$\angle 2$ and $\angle 4$ are alternate interior angles

$$\angle 4 = \angle 2$$

$$\text{Therefore, } \angle 2 = 120^\circ$$

14. In Fig. 71, if $AB \parallel CD$ and $CD \parallel EF$, find $\angle ACE$

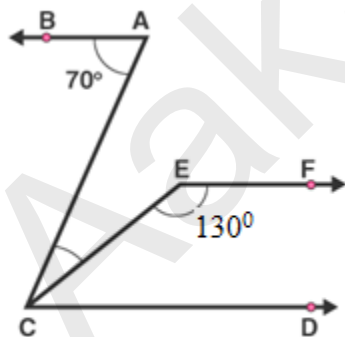


Fig. 71

Solution:

Given that, $AB \parallel CD$ and $CD \parallel EF$

Sum of the interior angles,

$$\angle CEF + \angle ECD = 180^\circ$$

$$130^\circ + \angle ECD = 180^\circ$$

$$\angle ECD = 180^\circ - 130^\circ$$

$$\angle ECD = 50^\circ$$

We know that alternate angles are equal

$$\angle BAC = \angle ACD$$

$$\angle BAC = \angle ECD + \angle ACE$$

$$\angle ACE = 70^\circ - 50^\circ$$

$$\angle ACE = 20^\circ$$

Therefore, $\angle ACE = 20^\circ$

15. In Fig. 72, if $l \parallel m$, $n \parallel p$ and $\angle 1 = 85^\circ$, find $\angle 2$.

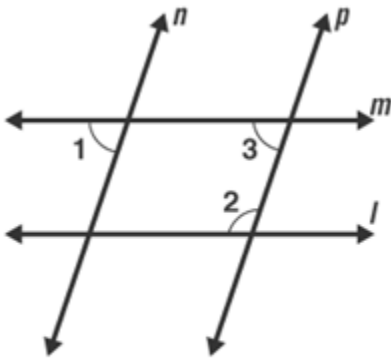


Fig. 72

Solution:

Given that, $\angle 1 = 85^\circ$

$\angle 1$ and $\angle 3$ are corresponding angles

So, $\angle 1 = \angle 3$

$$\angle 3 = 85^\circ$$

Sum of the interior angles is 180°

$$\angle 3 + \angle 2 = 180^\circ$$

$$\angle 2 = 180^\circ - 85^\circ$$

$$\angle 2 = 95^\circ$$

16. In Fig. 73, a transversal n cuts two lines l and m . If $\angle 1 = 70^\circ$ and $\angle 7 = 80^\circ$, is $l \parallel m$?

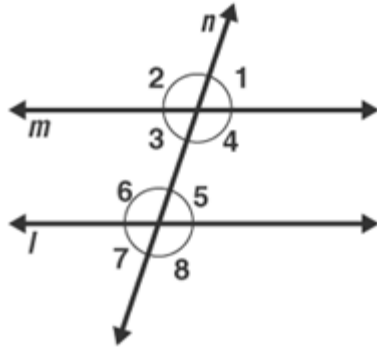


Fig. 73

Solution:

Given $\angle 1 = 70^\circ$ and $\angle 7 = 80^\circ$

We know that if the alternate exterior angles of the two lines are equal, then the lines are parallel.

Here, $\angle 1$ and $\angle 7$ are alternate exterior angles, but they are not equal

$\angle 1 \neq \angle 7$

17. In Fig. 74, a transversal n cuts two lines l and m such that $\angle 2 = 65^\circ$ and $\angle 8 = 65^\circ$. Are the lines parallel?

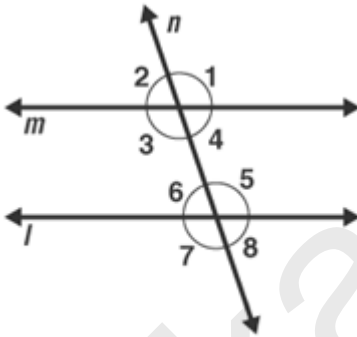


Fig. 74

Solution:

From the figure $\angle 2 = \angle 4$ are vertically opposite angles,

$\angle 2 = \angle 4 = 65^\circ$

$\angle 8 = \angle 6 = 65^\circ$

Therefore, $\angle 4 = \angle 6$

Hence, $l \parallel m$

18. In Fig. 75, Show that $AB \parallel EF$.

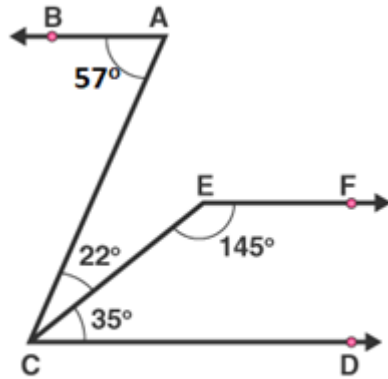


Fig. 75

Solution:

We know that,

$$\angle ACD = \angle ACE + \angle ECD$$

$$\angle ACD = 22^\circ + 35^\circ$$

$$\angle ACD = 57^\circ = \angle BAC$$

Thus, lines BA and CD are intersected by the line AC such that, $\angle ACD = \angle BAC$

So, the alternate angles are equal

Therefore, $AB \parallel CD$ 1

Now,

$$\angle ECD + \angle CEF = 35^\circ + 145^\circ = 180^\circ$$

This, shows that sum of the angles of the interior angles on the same side of the transversal CE is 180°

So, they are supplementary angles

Therefore, $EF \parallel CD$ 2

From equation 1 and 2

We conclude that, $AB \parallel EF$

19. In Fig. 76, $AB \parallel CD$. Find the values of x, y, z.

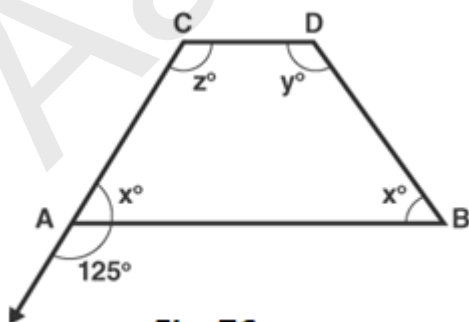


Fig. 76

Solution:

Given that $AB \parallel CD$

Linear pair,

$$\angle x + 125^\circ = 180^\circ$$

$$\angle x = 180^\circ - 125^\circ$$

$$\angle x = 55^\circ$$

Corresponding angles

$$\angle z = 125^\circ$$

Adjacent interior angles

$$\angle x + \angle z = 180^\circ$$

$$\angle x + 125^\circ = 180^\circ$$

$$\angle x = 180^\circ - 125^\circ$$

$$\angle x = 55^\circ$$

Adjacent interior angles

$$\angle x + \angle y = 180^\circ$$

$$\angle y + 55^\circ = 180^\circ$$

$$\angle y = 180^\circ - 55^\circ$$

$$\angle y = 125^\circ$$

20. In Fig. 77, find out $\angle PXR$, if $PQ \parallel RS$.

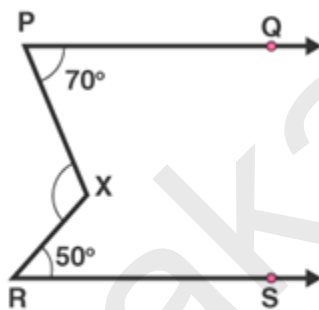


Fig. 77

Solution:

Given $PQ \parallel RS$

We need to find $\angle PXR$

$$\angle XRS = 50^\circ$$

$$\angle XPQ = 70^\circ$$

Given, that $PQ \parallel RS$

$$\angle PXR = \angle XRS + \angle XPR$$

$$\angle PXR = 50^\circ + 70^\circ$$

$$\angle PXR = 120^\circ$$

Therefore, $\angle PXR = 120^\circ$

21. In Figure, we have

(i) $\angle MLY = 2\angle LMQ$

(ii) $\angle XLM = (2x - 10)^\circ$ and $\angle LMQ = (x + 30)^\circ$, find x .

(iii) $\angle XLM = \angle PML$, find $\angle ALY$

(iv) $\angle ALY = (2x - 15)^\circ$, $\angle LMQ = (x + 40)^\circ$, find x .

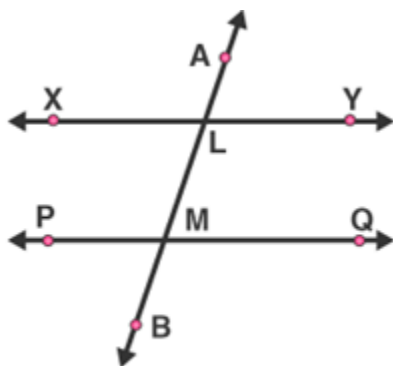


Fig. 78

Solution:

(i) $\angle MLY$ and $\angle LMQ$ are interior angles

$$\angle MLY + \angle LMQ = 180^\circ$$

$$2\angle LMQ + \angle LMQ = 180^\circ$$

$$3\angle LMQ = 180^\circ$$

$$\angle LMQ = 180^\circ / 3$$

$$\angle LMQ = 60^\circ$$

(ii) $\angle XLM = (2x - 10)^\circ$ and $\angle LMQ = (x + 30)^\circ$, find x .

$$\angle XLM = (2x - 10)^\circ \text{ and } \angle LMQ = (x + 30)^\circ$$

$\angle XLM$ and $\angle LMQ$ are alternate interior angles

$$\angle XLM = \angle LMQ$$

$$(2x - 10)^\circ = (x + 30)^\circ$$

$$2x - x = 30^\circ + 10^\circ$$

$$x = 40^\circ$$

Therefore, $x = 40^\circ$

(iii) $\angle XLM = \angle PML$, find $\angle ALY$

$$\angle XLM = \angle PML$$

Sum of interior angles is 180 degrees

$$\angle XLM + \angle PML = 180^\circ$$

$$\angle XLM + \angle XLM = 180^\circ$$

$$2\angle XLM = 180^\circ$$

$$\angle XLM = 180^\circ/2$$

$$\angle XLM = 90^\circ$$

$\angle XLM$ and $\angle ALY$ are vertically opposite angles

$$\text{Therefore, } \angle ALY = 90^\circ$$

(iv) $\angle ALY = (2x - 15)^\circ$, $\angle LMQ = (x + 40)^\circ$, find x .

$\angle ALY$ and $\angle LMQ$ are corresponding angles

$$\angle ALY = \angle LMQ$$

$$(2x - 15)^\circ = (x + 40)^\circ$$

$$2x - x = 40^\circ + 15^\circ$$

$$x = 55^\circ$$

$$\text{Therefore, } x = 55^\circ$$

22. In Fig. 79, $DE \parallel BC$. Find the values of x and y .

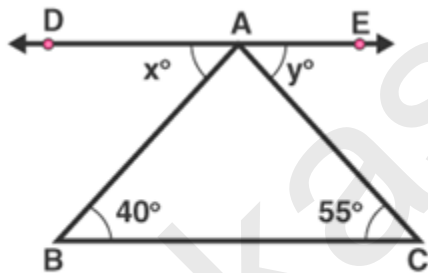


Fig. 79

Solution:

We know that,

ABC, DAB are alternate interior angles

$$\angle ABC = \angle DAB$$

$$\text{So, } x = 40^\circ$$

And ACB, EAC are alternate interior angles

$$\angle ACB = \angle EAC$$

$$\text{So, } y = 55^\circ$$

23. In Fig. 80, line AC $\parallel$ line DE and $\angle ABD = 32^\circ$, Find out the angles x and y if $\angle E = 122^\circ$.

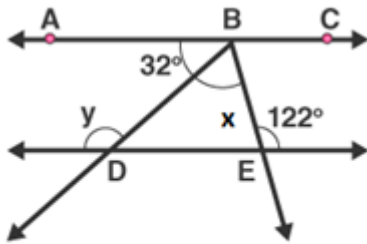


Fig. 80

Solution:

Given line AC $\parallel$ line DE and $\angle ABD = 32^\circ$

$\angle BDE = \angle ABD = 32^\circ$ – Alternate interior angles

$\angle BDE + y = 180^\circ$ – linear pair

$$32^\circ + y = 180^\circ$$

$$y = 180^\circ - 32^\circ$$

$$y = 148^\circ$$

$\angle ABE = \angle E = 122^\circ$ – Alternate interior angles

$$\angle ABD + \angle DBE = 122^\circ$$

$$32^\circ + x = 122^\circ$$

$$x = 122^\circ - 32^\circ$$

$$x = 90^\circ$$

24. In Fig. 81, side BC of $\triangle ABC$ has been produced to D and CE $\parallel$ BA. If $\angle ABC = 65^\circ$, $\angle BAC = 55^\circ$, find $\angle ACE$, $\angle ECD$, $\angle ACD$.

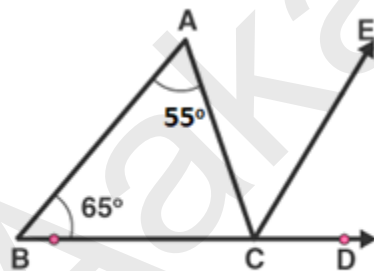


Fig. 81

Solution:

Given $\angle ABC = 65^\circ$, $\angle BAC = 55^\circ$

Corresponding angles,

$$\angle ABC = \angle ECD = 65^\circ$$

Alternate interior angles,

$$\angle BAC = \angle ACE = 55^\circ$$

Now, $\angle ACD = \angle ACE + \angle ECD$

$$\angle ACD = 55^\circ + 65^\circ$$

$$= 120^\circ$$

25. In Fig. 82, line $CA \perp AB \parallel$ line CR and line $PR \parallel$ line BD . Find $\angle x$, $\angle y$, $\angle z$.

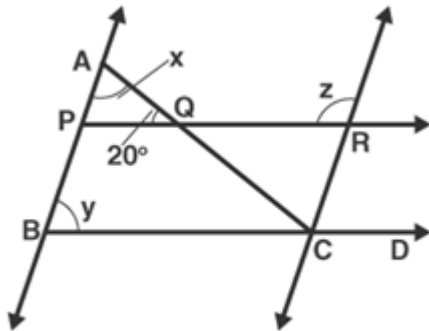


Fig. 82

Solution:

Given that, $CA \perp AB$

$$\angle CAB = 90^\circ$$

$$\angle AQP = 20^\circ$$

By, angle of sum property

In $\triangle ABC$

$$\angle CAB + \angle AQP + \angle APQ = 180^\circ$$

$$\angle APQ = 180^\circ - 90^\circ - 20^\circ$$

$$\angle APQ = 70^\circ$$

y and $\angle APQ$ are corresponding angles

$$y = \angle APQ = 70^\circ$$

$\angle APQ$ and $\angle z$ are interior angles

$$\angle APQ + \angle z = 180^\circ$$

$$\angle z = 180^\circ - 70^\circ$$

$$\angle z = 110^\circ$$

26. In Fig. 83, $PQ \parallel RS$. Find the value of x .

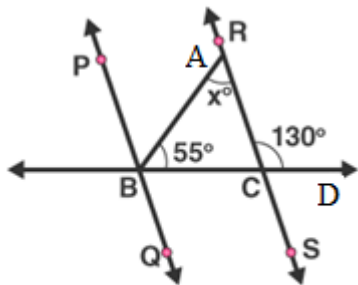


Fig. 83

Solution:

Given, linear pair,

$$\angle RCD + \angle RCB = 180^\circ$$

$$\angle RCB = 180^\circ - 130^\circ$$

$$= 50^\circ$$

In $\triangle ABC$,

$$\angle BAC + \angle ABC + \angle BCA = 180^\circ$$

By, angle sum property

$$\angle BAC = 180^\circ - 55^\circ - 50^\circ$$

$$\angle BAC = 75^\circ$$

27. In Fig. 84, $AB \parallel CD$ and $AE \parallel CF$, $\angle FCG = 90^\circ$ and $\angle BAC = 120^\circ$. Find the value of x , y and z .

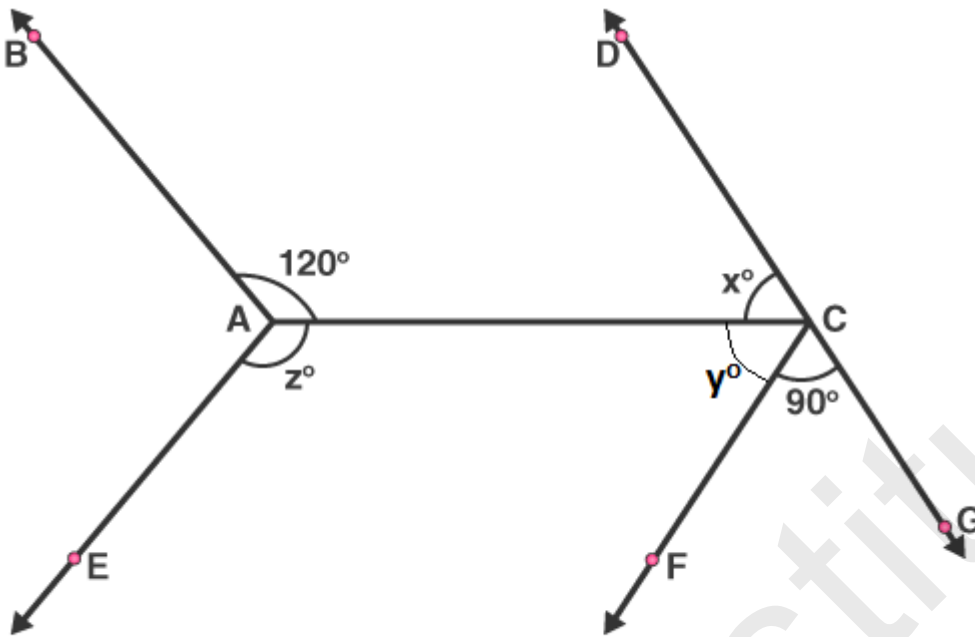


Fig. 84

Solution:

Alternate interior angle

$$\angle BAC = \angle ACG = 120^\circ$$

$$\angle ACF + \angle FCG = 120^\circ$$

$$\text{So, } \angle ACF = 120^\circ - 90^\circ$$

$$= 30^\circ$$

Linear pair,

$$\angle DCA + \angle ACG = 180^\circ$$

$$\angle x = 180^\circ - 120^\circ$$

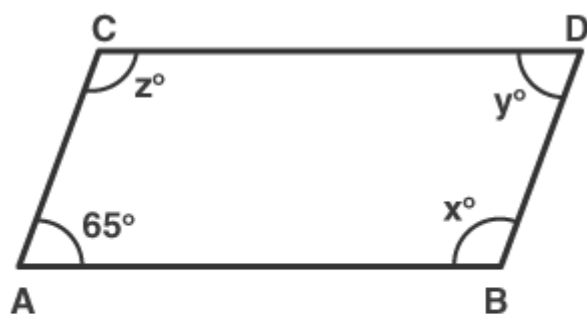
$$= 60^\circ$$

$$\angle BAC + \angle BAE + \angle EAC = 360^\circ$$

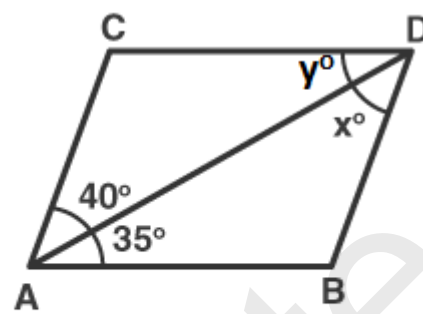
$$\angle CAE = 360^\circ - 120^\circ - (60^\circ + 30^\circ)$$

$$= 150^\circ$$

28. In Fig. 85, $AB \parallel CD$ and $AC \parallel BD$. Find the values of x , y , z .



(i)



(ii)

Fig. 85

Solution:

(i) Since, $AC \parallel BD$ and $CD \parallel AB$, ABCD is a parallelogram

Adjacent angles of parallelogram,

$$\angle CAB + \angle ACD = 180^\circ$$

$$\angle ACD = 180^\circ - 65^\circ$$

$$= 115^\circ$$

Opposite angles of parallelogram,

$$\angle CAB = \angle CDB = 65^\circ$$

$$\angle ACD = \angle DBA = 115^\circ$$

(ii) Here,

$AC \parallel BD$ and $CD \parallel AB$

Alternate interior angles,

$$\angle CAD = x = 40^\circ$$

$$\angle DAB = y = 35^\circ$$

29. In Fig. 86, state which lines are parallel and why?

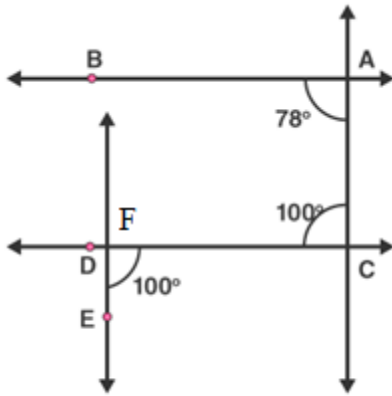


Fig. 86

Solution:

Let, F be the point of intersection of the line CD and the line passing through point E.

Here, $\angle ACD$ and $\angle CDE$ are alternate and equal angles.

So, $\angle ACD = \angle CDE = 100^\circ$

Therefore, $AC \parallel EF$

30. In Fig. 87, the corresponding arms of $\angle ABC$ and $\angle DEF$ are parallel. If $\angle ABC = 75^\circ$, find $\angle DEF$.

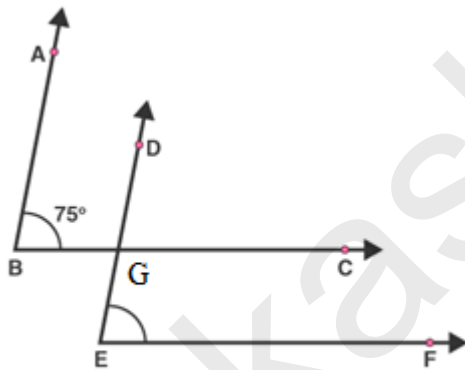


Fig. 87

Solution:

Let, G be the point of intersection of the lines BC and DE

Since, $AB \parallel DE$ and $BC \parallel EF$

The corresponding angles are,

$\angle ABC = \angle DGC = \angle DEF = 75^\circ$