Total Marks : 50

2 Marks

30 x 2 = 60

1) Identify which ones are parallelograms and which are not.

Answer : It is not a parallelogram

2) Identify which ones are parallelograms and which are not.

Answer : It is not a parallelogram

3) Identify which ones are parallelograms and which are not.

Answer : It is a parallelogram

4) Which ones are not quadrilaterals?

Answer : It is a quadrilateral

5) Which ones are not quadrilaterals?

Answer : It is a quadrilateral

6) Which ones are not quadrilaterals

Answer : It is not a quadrilateral

7) Identify which ones are trapeziums and which are not.

Answer : It is not a trapezium

8) Identify which ones are trapeziums and which are not.

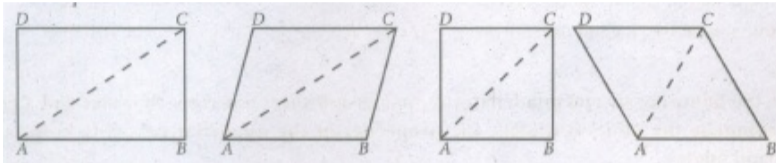**Answer :** It is not a trapezium

9) Identify which ones are trapeziums and which are not.
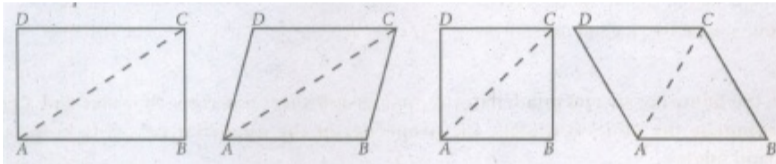

Answer : It is not a trapezium

10) Step -1

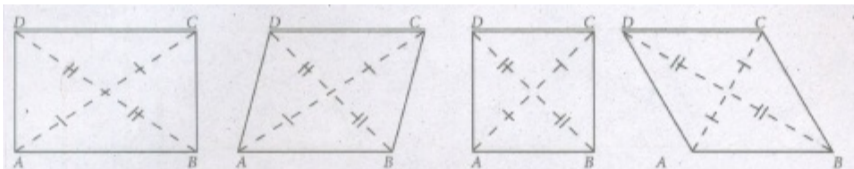Cut out four different quadrilaterals from coloured glazed papers.

Step - 2

Fold the quadrilaterals along their respective diagonals. Press to make creases. Here, dotted line represent the creases.

Step -3

Fold the quadrilaterals along both of their diagonals. Press to make creases.

We observe that two imposed triangles are congruent to each other. Measure the lengths of portions of diagonals and angles between the diagonals.

Also do the same for the quadrilaterals such as Trapezium, Isosceles Trapezium and Kite. From the above activity, measure the lengths of diagonals and angles between the diagonals and record them in the table below:

S.No	Name of the quadrilateral	Length along diagonals						Measure of angles			
		AC	BD	OA	OB	OC	OD	∠AOB	∠BOC	∠COD	∠DOA
1.	Trapezium										
2.	Isosceles Trapezium										
3.	Parallelogram										
4.	Rectangle										
5.	Rhombus										
6.	Square										
7.	Kite										

Answer :

11) Objective: To locate the circumcentre of a triangle using paper folding.

Procedure: find the perpendicular bisectors for any two sides of the given triangle. The meeting point of these is the circumcentre of the given triangle.
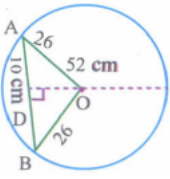
Answer :

12) Objective: To locate the Orthocentre of a triangle using paper folding.

Procedure: with any two vertices of the triangle as external points, construct the perpendiculars to opposite sides. The point of intersection of the perpendiculars is the Orthocentre of the given triangle.

Answer :

13) The diameter of the circle is 52cm and the length of one of its chord is 20cm. Find the distance of the chord from the centre.
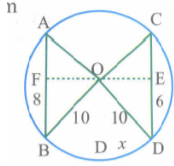
$$OD = \sqrt{26^2 - 10^2}$$
$$= \sqrt{676 - 100}$$
$$= \sqrt{576} = 24cm$$

14) In a circle, AB and CD are two parallel chords with centre O and radius 10 cm such that AB = 16 cm and CD = 12 cm determine the distance between the two chords?

Answer :

The distance between two chord FE

= OE + OF

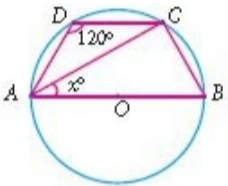OE = $\sqrt{10^2 - 6^2} = \sqrt{100 - 36} = \sqrt{64} = 8cm$

OF = $\sqrt{10^2 - 8^2}$

= $\sqrt{100 - 64}$

= $\sqrt{36} = 6cm$

∴ FE = 8 cm + 6 cm = 14 cm

∴ Distance between the chords is 14 cm

15) Find the value of x in the given figure

Answer : In the cyclic quadrilateral ABCD

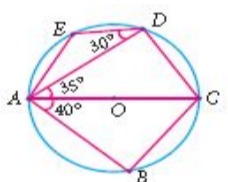$\angle ABC = 180^0\text{-}120^0 = 60^0$

$\angle BCA = 90^0$

∴ x = $\angle BAC = 180^0 - (90^0 + 60^0) = 30^0$

16) In the given figure, AC is the diameter of the circle with centre O. If $\angle ADE = 30°$; $\angle DAC = 35°$ and $\angle CAB = 40°$. Find

(i) $\angle ACD$

(ii) $\angle ACB$

(iii) $\angle DAE$

Answer : (i) $\angle ACD = 180^0 - (90^0 + 35^0)$

= $18^0 - 125^0 = 55^0$

(ii) $\angle ACB = 180^0 - (90^0 + 40^0)$

= $180^0 - 130^0 = 50^0$

(iii) $\angle ADC = 90^0$

$\angle CAE = 180^0 - 120^0 = 60^0$

∴ $\angle DAE = 60^0 - 35^0 = 25^0$

17) Find all the angles of the given cyclic quadrilateral ABCD in the figure.
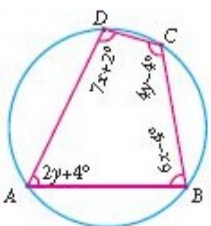
Answer : In the cyclic quadrilateral $\angle A + \angle C = 180^0$

$2y + \cancel{4} + 4y - \cancel{4} = 180^0$

$6y = 180^0$

$y = \dfrac{180^0}{6} = 30^0$

$\angle B + \angle D = 6 \times -4 + 7 \times +2$

$13 \times -2 = 180^0$

$13 \times = 180 + 2 = 182^0$

$x = \dfrac{182}{13} = 14^0$

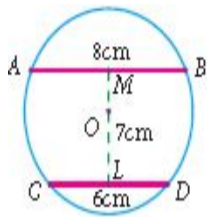$\therefore \angle A = 2(30) + 4^0 = 64^0$

$\angle B = 6(14) - 4^0 = 84 - 4 = 80^0$
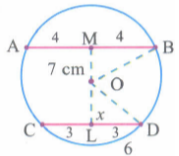
$\angle C = 4(30) - 4 = 120 - 4 = 116^0$

$\angle D = 7(14) + 2 = 98 + 2 = 100^0$

18) In the given figure, AB and CD are the parallel chords of a circle with centre O. Such that AB = 8cm and CD = 6cm. If OM ⊥ AB and OL⊥CD distance between LM is 7cm. Find the radius of the circle?

Answer : In the figure

LM = 7cm

Let OM = (7-x)cm

MB = $\dfrac{8}{2}$ = 4cm

OB = $\sqrt{4^2 + (7-x)^2}$

OD = $\sqrt{3^2 + x^2}$

$\sqrt{16 + (7-x)^2} = \sqrt{3^2 + x^2}$
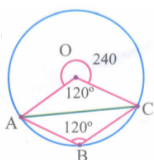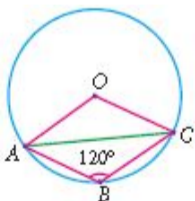
Squaring both sides

$16 + (7-x)^2 = 9 + x^2$

$16 + 49 - 14x + \cancel{x^2} = 9 + \cancel{x^2}$

$14x = 65 - 9$

$14x = 56 = x\dfrac{54}{14} = 4$

$\therefore$ Radius OD = $\sqrt{3^2 + 4^2} = \sqrt{9 + 16} = \sqrt{25} = 5cm$

19) In figure $\angle ABC = 120^0$, where A, B and C are points on the circle with centre O. Find $\angle OAC$?

Answer :

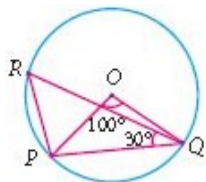reflex $\angle AOC = 2\angle ABC = 2 \times 120^0 = 240^0$

$\therefore \angle AOC = 360^0 - 240^0 = 120^0$

Hence $\angle OAC + \angle OCA = 180^0 - 120^0 = 60^0$

$\Rightarrow 2\angle AOC = 60^0$

$\Rightarrow \angle OAC = \dfrac{60^0}{2} = 30^0$ [$\because \angle OAC = \angle OCA$]

20) In the given figure, ∠POQ = 100° and ∠PQR = 30°, then find ∠RPO

Answer : In the figure∠POQ = 100⁰

∠PQR = 30⁰

$\angle PQR = \dfrac{1}{2}\angle PQR = \dfrac{1}{2} \times 100 = 50^0$

In△OPQ = ∠OQP =∠POQ = 180⁰

2∠OPQ = 180⁰

2∠ OPQ = 80⁰

∴. ∠OPQ = 40⁰

In △PRQ,

∠R+∠P+∠Q = 180⁰

50⁰ + (40 + x) + 30⁰ = 180⁰

(40 + x)⁰ = 180⁰ - 80 = 100⁰

x⁰ = 100⁰ - 40⁰ = 60⁰

∴. ∠RPO = x = 60⁰
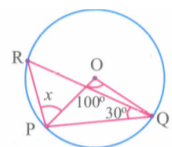
21) Find the supplement of the following angles.

140°

Answer : Supplement of 140° = 180⁰- 140°

= 40°

22) Find the supplement of the following angles.

121°48′

Answer : Supplement of 121°48' = 180° - 121°48'

= 58°12′

23) This is a copy of the tangram puzzle. The tangram puzzle consists of 7 geometric pieces which are normally boxed in the shape·of a square. The pieces, called 'tans', are used to create different patterns including animals, people, numbers, geometric shapes and many more.

You can make several polygons using the pieces in different ways.
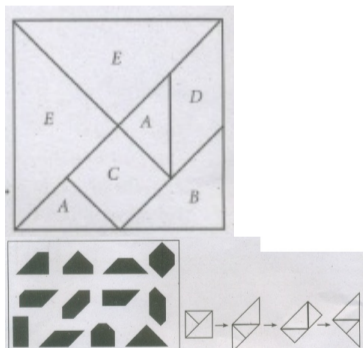
Answer : By using the given shapes, students has to make different shapes like birds, house, numbers, animals, rocket etc. These pictures are called tangram pictures.

24) Draw the following special quadrilaterals on a graph sheet, measure the sides and angles and complete the table to explore the properties of the quadrilaterals with respect to sides and angles.
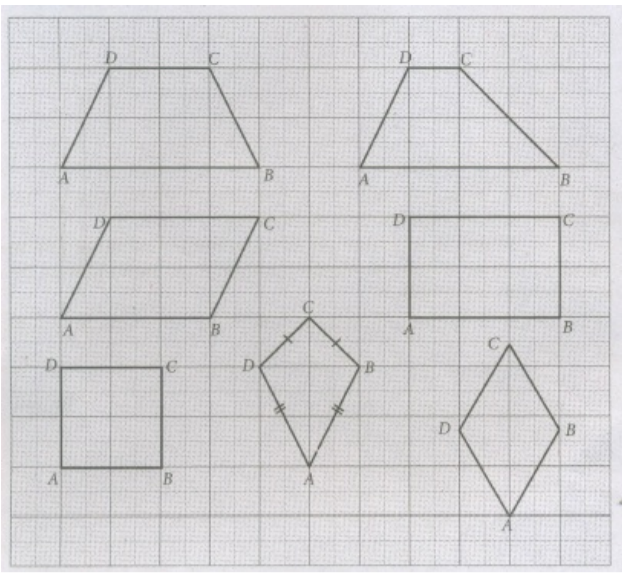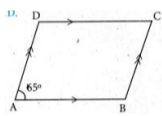
Answer :

25)

Procedure:

(I) Make a parallelogram on a chart/graph paper and cut it.

(ii) Draw diagonal of the parallelogram.

(iii) Cut along the diagonal and obtain two triangles.

(iv) Superimpose one triangle onto the other.

What do you conclude?

Answer :

26)

In the parallelogram ABCD if $\angle A$ = 65°, find $\angle B$, $\angle C$ and $\angle D$.

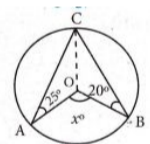**Answer :**

Let ABCD be a parallelogram in which $\angle A$ = 65°

Since AD || BC, we can treat AB as a transversal.

$\angle A + \angle B = 180°$

$65° + \angle B = 180°$

$\angle B = 180° - 65°$

$\angle B = 115°$

Since the opposite angles of a parallelogram are equal, we have

$\angle C = \angle A = 65°$ and $\angle D = \angle B = 115°$

$\angle B = 115°, \angle C = 65°$ and $\angle D = 115°$

27)

Find the value of x in the following figure.

Answer : Using the theorem, the angle subtended by an arc of a circle at the centre is double the angle subtended by it at any point on the remaining part of the circle.

$OA = OB = OC(\text{ radius })$

$\angle OCA = \angle OAC = 25°$

$\angle OBC = \angle OCB = 20°$

$\angle ACB = \angle OCA + \angle OCB$

$= 25° + 20° = 45°$

$\angle AOB = 2\angle ACB$

$x° = 2 \times 45° = 90°$

28)

A chord is 8 cm away from the centre of a circle of radius 17 cm. Find the length of the chord.

Answer :
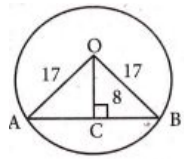
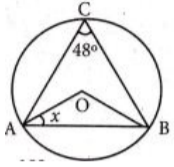In $\triangle$ ABC

$BC^2 = OB^2 - OC^2$

$= 17^2 - 8^2$

$= 289 - 64 = 225$

$\therefore BC = \sqrt{225} = 15$

Length of the chord AB = 2 (BC)

= 2 (15) = 30 cm

29) Find the value of x in the following figure.

Answer : $\angle AOB = 2$

$\angle ACB = 96°$

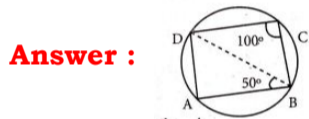in $\triangle OAB$

$\angle AOB + \angle OAB + \angle OBA = 180$

$96° + x + x = 180°$ (∵ DA = OB = radius)

2x = 180° - 96°

2x = 84°

x = 42°

30) In the figure at right, ABCD is a cyclic quadrilateral in which $\angle BCD = 100°$ and $\angle ABD = 50°$. find $\angle ADB$.

Answer :

ABCD is a cyclic quadrilateral,

$\angle BCD = 100°$

$\angle BAD = 80°$

$\angle ADB = 180° - (80° + 50°)$

$= 180° - 130° = 50°$