



ST. LAWRENCE HIGH SCHOOL

A JESUIT CHRISTIAN MINORITY INSTITUTION



CLASS 8

SUBJECT :Algebra and Geometry

Work sheet 3 answer key

Marks :15

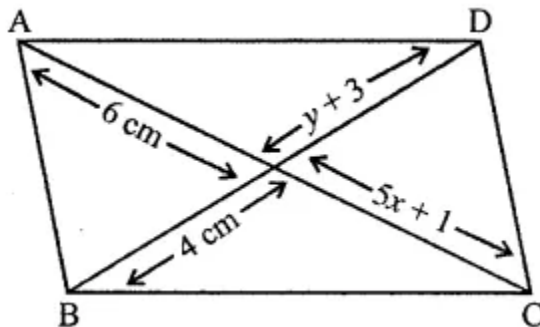
SPECIAL TYPES OF QUADRILATERAL

Date:9.4.2020

(Continued)

Answer all the following questions($1 \times 15 = 15$)

1. In the given figure, ABCD is a parallelogram, the values of x and y respectively are
 - (a) 1 cm, 1 cm
 - (b) 2 cm, 1 cm
 - (c) 1 cm, 2 cm
 - (d) 2 cm, 2 cm



Solution:

In the given figure, ABCD is a parallelogram

∴ Diagonals of a parallelogram bisect each other

∴ $AO = OC$ and $BO = OD$

∴ $6 = 5x + 1$

⇒ $5x = 6 - 1 = 5$

⇒ $x = \frac{5}{5}$

and $y + 3 = 4$

⇒ $y = 4 - 3 = 1$

∴ $x = 1, y = 4$ (a)

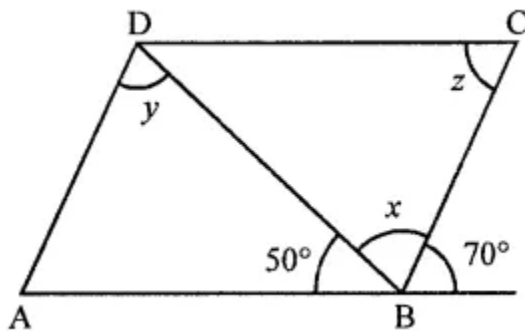
2. In the given figure, ABCD is a parallelogram, the values of x , y and z respectively are

(a) $60^\circ, 60^\circ, 70^\circ$

(b) $60^\circ, 70^\circ, 60^\circ$

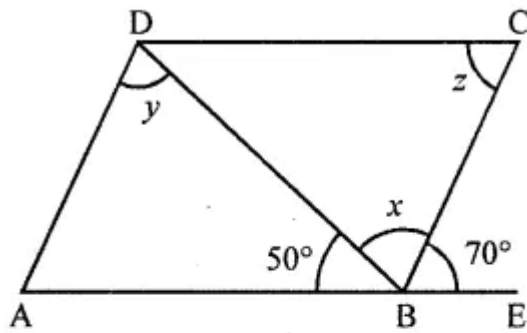
(c) $70^\circ, 60^\circ, 60^\circ$

(d) none of these



Solution:

In the given figure,



ABCD is a parallelogram, BD is its one diagonal

$$\angle ABD + \angle DBC + \angle CBE = 180^\circ$$

(Angles on one side of a line)

$$\Rightarrow 50^\circ + x + 70^\circ = 180^\circ$$

$$x + 120^\circ = 180^\circ$$

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

But $y = x$ (Alternate angles)

$$\therefore y = 60^\circ$$

$z = 70^\circ$ (Alternate angles)

$$\therefore x = 60^\circ, y = 60^\circ, z = 70^\circ \text{ (a)}$$

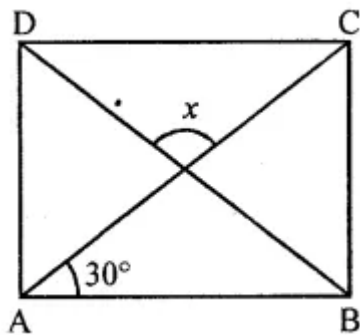
3. In the given figure, ABCD is a rectangle, the value of angle x is

(a) 60°

(b) 90°

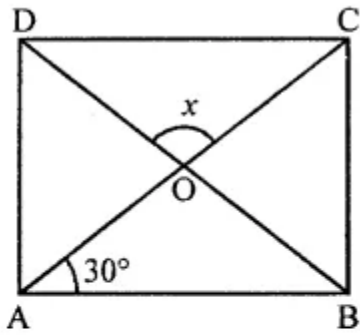
(c) 120°

(d) none of these



Solution:

In the given figure, ABCD is a rectangle



$$\therefore \angle OBA = \angle OAB = 30^\circ$$

In $\triangle AOB$,

$$\angle AOB = \angle COD \text{ (Vertically opposite angles)}$$

$$\angle AOB = x$$

$$\angle AOB + \angle OBA + \angle OAB = 180^\circ \text{ (Angles of a triangle)}$$

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

$$\Rightarrow x = 180^\circ - 30^\circ - 30^\circ = 120^\circ$$

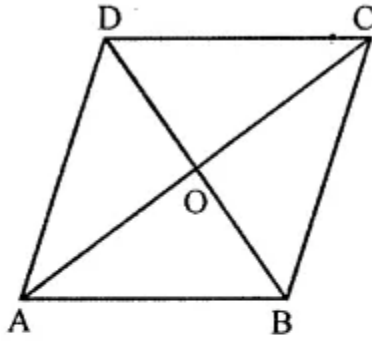
$$\therefore x = 120^\circ \text{ (c)}$$

4. In a rhombus ABCD, the diagonals AC and BD are respectively 8 cm and 6 cm. The length of each side of the rhombus is
- (a) 7 cm
 - (b) 5 cm
 - (c) 6 cm
 - (d) 8 cm

Solution:

In rhombus ABCD

Diagonals AC and BD are 8 cm and 6 cm



$\therefore AC = 8 \text{ cm}$ and $BD = 6 \text{ cm}$

\because Diagonals of a rhombus bisect each other at right angles

$$AO = OC = \frac{8}{2} = 4 \text{ cm,}$$

$$BO = OD = \frac{6}{2} = 3 \text{ cm}$$

\therefore In right $\triangle AOB$

$$AB = \sqrt{AO^2 + BO^2} = \sqrt{4^2 + 3^2}$$

$$= \sqrt{16 + 9} = \sqrt{25} = 5 \text{ cm}$$

Each side of rhombus = 5 cm (b)

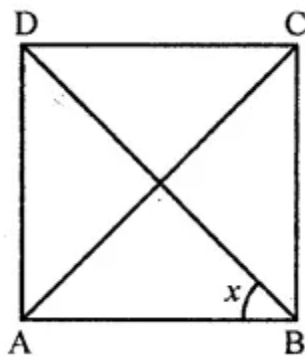
5. In the given figure, ABCD is a square, the value of angle x is

(a) 30°

(b) 45°

(c) 60°

(d) not possible to find

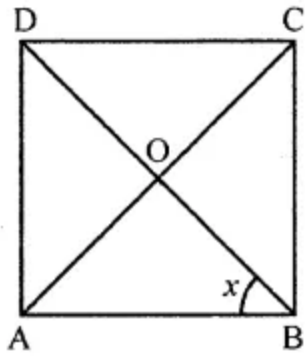


Solution:

In the given figure,

ABCD is a square whose diagonals AC and BD

bisect each other at O.



∴ Diagonals of a square bisect the opposite angles.

$$\therefore x = \frac{1}{2} \times \angle B = \frac{1}{2} \times 90^\circ = 45^\circ \text{ (b)}$$

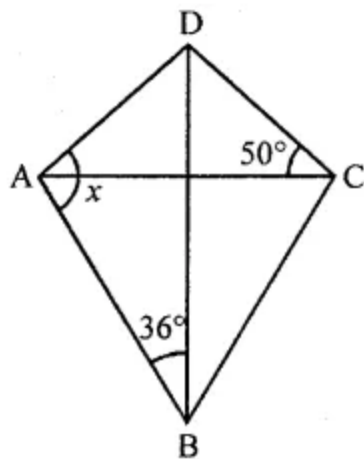
6. | In the given figure, ABCD is a kite, the value of angle x is

(a) 86°

(b) 100°

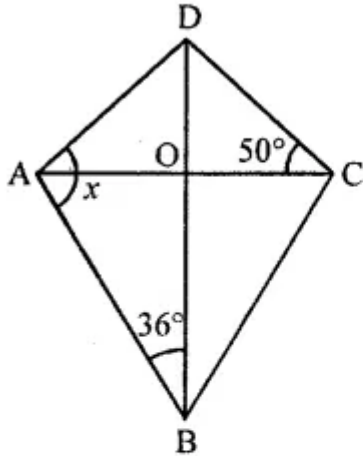
(c) 104°

(d) none of these



Solution:

In the given figure, ABCD is a kite whose diagonals AC and BD intersect at O at right angles.



In $\triangle OAB$, $\angle O = 90^\circ$

$\therefore \angle OAB + \angle ABO = 90^\circ$

$\Rightarrow \angle OAB + 36^\circ = 90^\circ$

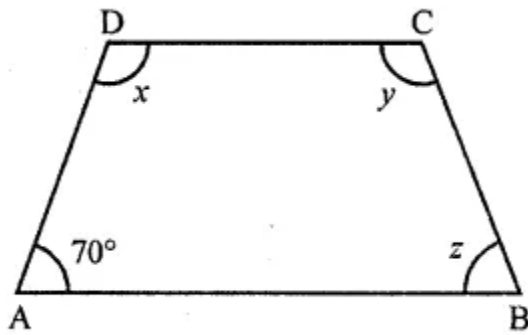
$\Rightarrow \angle OAB = 90^\circ - 36^\circ = 54^\circ$

But $\angle OAD = \angle OCD = 50^\circ$

$x = \angle DAO + \angle AOB$

$\Rightarrow x = 50^\circ + 54^\circ = 104^\circ$ (c)

7. In the given figure, ABCD is an isosceles trapezium. The values of x, y and z respectively are
- (a) $110^\circ, 110^\circ, 70^\circ$
 - (b) $110^\circ, 70^\circ, 110^\circ$
 - (c) $70^\circ, 110^\circ, 110^\circ$
 - (d) none of these



Solution:

In isosceles trapezium $\angle A = 70^\circ$

But $\angle B = \angle A = 70^\circ \Rightarrow z = 70^\circ$

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

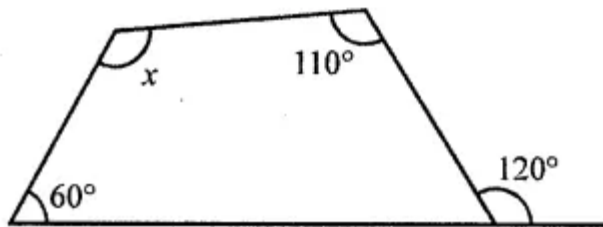
$\Rightarrow x = 180^\circ - 70^\circ = 110^\circ$

But $y = x = 110^\circ$

$\therefore 110^\circ, 110^\circ, 70^\circ$ (a)

8. In the given figure, the value of x is

- (a) 120°
- (b) 130°
- (c) 140°
- (d) 150°



Solution:

In the given figure,

Sum of angles of a quadrilateral = 360°

$\therefore 60^\circ + (180^\circ - 120^\circ) + 110^\circ + x = 360^\circ$

$\Rightarrow 60^\circ + 60^\circ + 110^\circ + x = 360^\circ$

$230^\circ + x = 360^\circ$

$\therefore x = 360^\circ - 230^\circ = 130^\circ$ (b)

9. The lengths of two adjacent sides of a parallelogram are in the ratio 1 : 2. If the perimeter of a parallelogram is 60 cm, then the length of its sides are
- (a) 6 cm, 12 cm
 - (b) 8 cm, 16 cm
 - (c) 9 cm, 18 cm
 - (d) 10 cm, 20 cm

Solution:

Ratio in the length of two adjacent sides of a parallelogram = 1 : 2

Perimeter = 60 cm

\therefore Sum of two adjacent sides = $\frac{60}{2} = 30$ cm

Let first side = x, then second side = 2x

$\therefore x + 2x = 30 \Rightarrow 3x = 30$

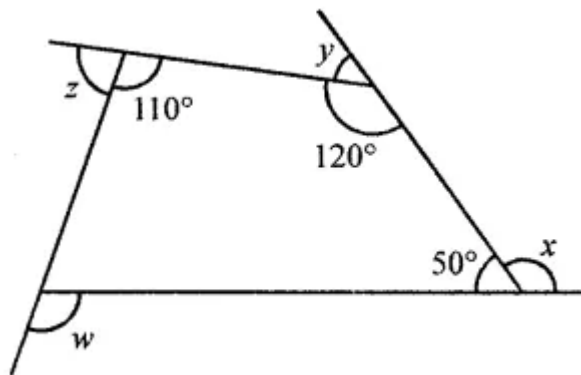
$x = \frac{30}{3} = 10$ cm

First side = 10 cm

and second side = $10 \times 2 = 20$ cm (d)

10. In the given figure, the value of $x + y + z + w$ is

- (a) 180°
- (b) 270°
- (c) 300°
- (d) 360°



Solution:

In the given figure,

Sum of exterior angles of a quadrilateral = 360°

$\therefore x + y + z + w = 360^\circ$ (d)

11. The diagonal of a square bisects the interior angle in how many degree?

- a) 45°
- b) 90°
- c) 75°
- d) 30°

Solutio: a) by property

12. The adjacent angles of a parallelogram are 100° and 80° . One of the other angle is?

- a) 60°
- b) 70°
- c) 100°
- d) 50°

Solution: c) opposite angles are equal

14. The diagonals of which figure intersect at right angles?

- a) kite
- b) trapezium
- c) isosceles trapezium
- d) none of these

Solution: a) by property

15. One property of isosceles trapezium is

- a) opposite angles are not equal
- b) opposite angles are equal
- c) diagonals are not equal
- d) diagonals bisect

Solution: b) by property

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