



# ST. LAWRENCE HIGH SCHOOL

A JESUIT CHRISTIAN MINORITY INSTITUTION



CLASS 8

SUBJECT :Algebra and Geometry

Work sheet 19 answer key

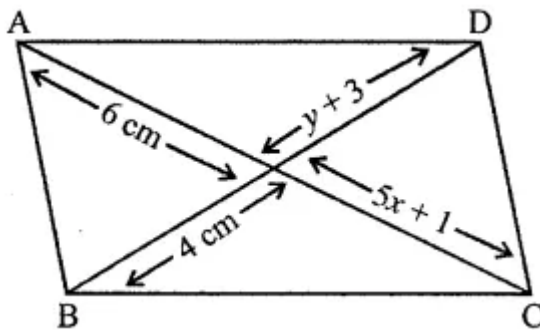
Marks :15

SPECIAL TYPES OF QUADRILATERAL

Date:20.3.2021

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

- In the given figure, ABCD is a parallelogram, the values of  $x$  and  $y$  respectively are
  - 1 cm, 1 cm
  - 2 cm, 1 cm
  - 1 cm, 2 cm
  - 2 cm, 2 cm



Solution:

In the given figure, ABCD is a parallelogram

∴ Diagonals of a parallelogram bisect each other

∴  $AO = OC$  and  $BO = OD$

$$\therefore 6 = 5x + 1$$

$$\Rightarrow 5x = 6 - 1 = 5$$

$$\Rightarrow x = \frac{5}{5}$$

and  $y + 3 = 4$

$$\Rightarrow y = 4 - 3 = 1$$

$$\therefore x = 1, y = 4 \text{ (a)}$$

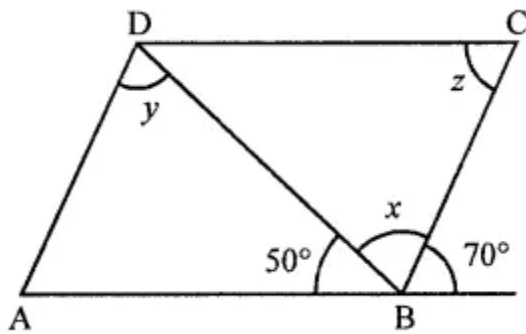
2. In the given figure, ABCD is a parallelogram, the values of  $x$ ,  $y$  and  $z$  respectively are

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

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

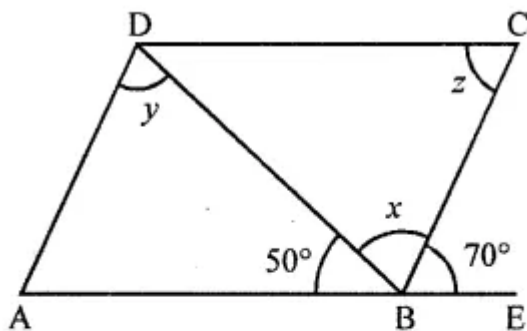
(c)  $70^\circ$ ,  $60^\circ$ ,  $60^\circ$

(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)

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

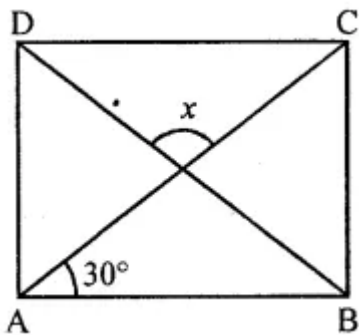
3. In the given figure, ABCD is a rectangle, the value of angle x is

(a)  $60^\circ$

(b)  $90^\circ$

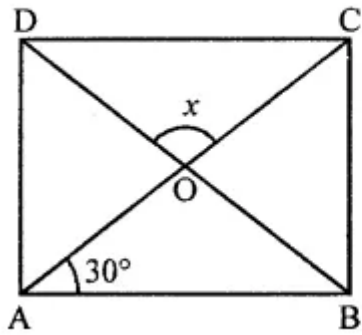
(c)  $120^\circ$

(d) none of these



Solution:

In the given figure, ABCD is a rectangle



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

In  $\triangle AOB$ ,

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

$$\angle AOB = x$$

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

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

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

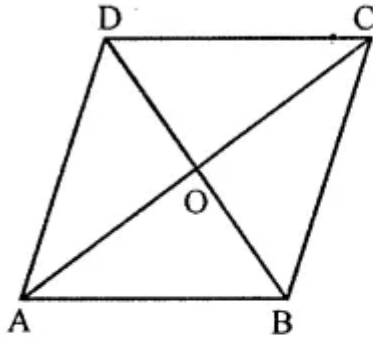
$$\therefore x = 120^\circ \text{ (c)}$$

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)

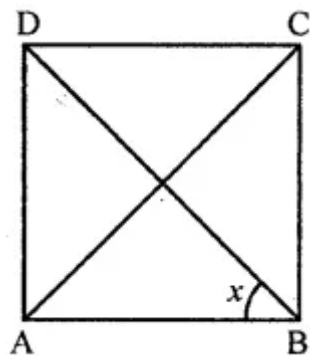
5. In the given figure, ABCD is a square, the value of angle x is

(a)  $30^\circ$

(b)  $45^\circ$

(c)  $60^\circ$

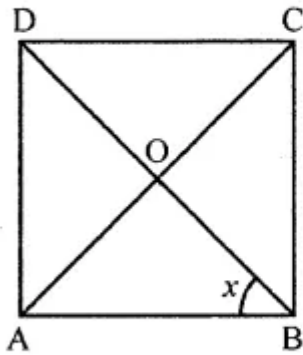
(d) not possible to find



Solution:

In the given figure,

ABCD is a square whose diagonals AC and BD bisect each other at O.

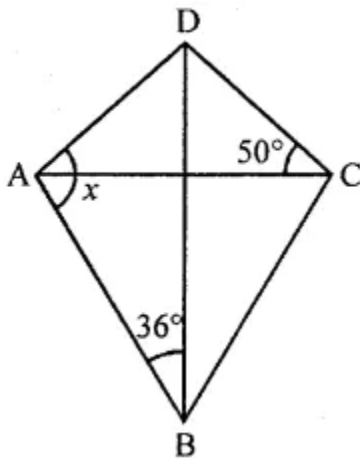


∴ Diagonals of a square bisect the opposite angles.

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

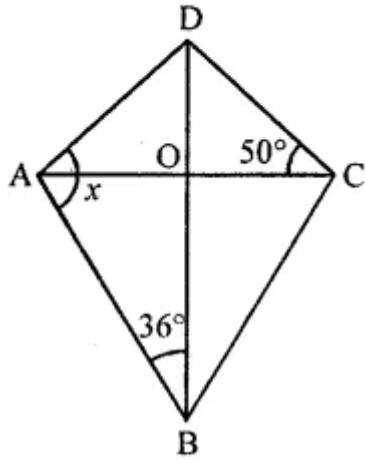
6. | In the given figure, ABCD is a kite, the value of angle x is

- (a)  $86^\circ$
- (b)  $100^\circ$
- (c)  $104^\circ$
- (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  $\triangle OAB$ ,  $\angle O = 90^\circ$

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

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

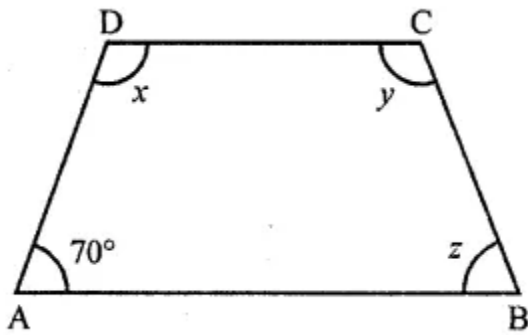
$\Rightarrow \angle OAB = 90^\circ - 36^\circ = 54^\circ$

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

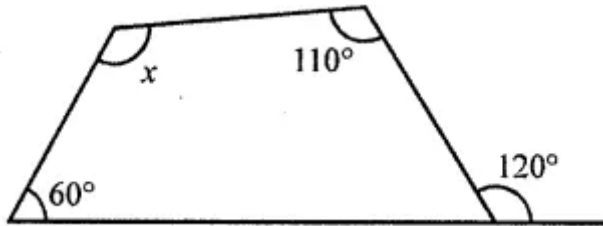
$\Rightarrow x = 180^\circ - 70^\circ = 110^\circ$

But  $y = x = 110^\circ$

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

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

- (a)  $120^\circ$
- (b)  $130^\circ$
- (c)  $140^\circ$
- (d)  $150^\circ$



Solution:

In the given figure,

Sum of angles of a quadrilateral =  $360^\circ$

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

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

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

$\therefore x = 360^\circ - 230^\circ = 130^\circ$  (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 =  $2x$

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

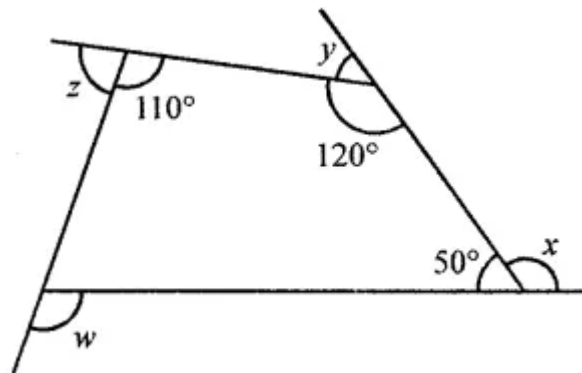
$x = \frac{30}{3} = 10$  cm

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)  $180^\circ$
- (b)  $270^\circ$
- (c)  $300^\circ$
- (d)  $360^\circ$



Solution:

In the given figure,

Sum of exterior angles of a quadrilateral =  $360^\circ$

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

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

- a)  $45^\circ$
- b)  $90^\circ$
- c)  $75^\circ$
- d)  $30^\circ$

Solutio: a) by property

12. The adjacent angles of a parallelogram are  $100^\circ$  and  $80^\circ$ . One of the other angle is?

- a)  $60^\circ$
- b)  $70^\circ$
- c)  $100^\circ$
- d)  $50^\circ$

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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