

Worksheet 2015-8EO-00004(2)

(1) Complete the following:

(a) A parallelogram is a quadrilateral with the opposite sides parallel.

(per definition)

(b) A kite is a quadrilateral with two pair of adjacent sides equal.

(per definition)

(c) A square is a parallelogram with all sides equal and all angles equal to 90° .

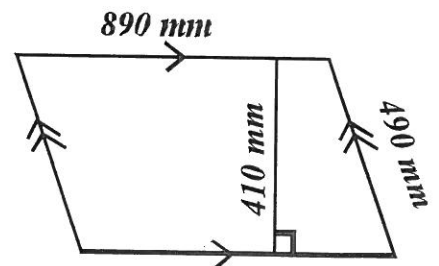
(d) A trapezium is a quadrilateral with one pair of opposite sides parallel.

(2) Calculate the area and perimeter of the following quadrilaterals:

(a)

$$\begin{aligned} \text{Perimeter} &= 2(L + B) \\ &= 2(890 \text{ mm} + 490 \text{ mm}) \\ &= 2760 \text{ mm} \end{aligned}$$

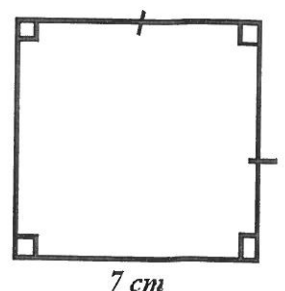
$$\begin{aligned} \text{Area} &= L \times B = 890 \text{ mm} \times 490 \text{ mm} \\ &= 436100 \text{ mm}^2 \end{aligned}$$



(b)

$$\begin{aligned} \text{Perimeter} &= 4 \times 7 \text{ cm} \\ &= 28 \text{ cm} \end{aligned}$$

$$\begin{aligned} \text{Area} &= L^2 \\ &= (7 \text{ cm})^2 \\ &= 49 \text{ cm}^2 \end{aligned}$$



(3) Match the two columns:

	Column A:			Column B:
(a)	All sides are equal in length.	R	P ✓	Parallelogram
(b)	Opposite sides are equal in length.	P	Q ✓	Rectangle
(c)	Adjacent sides are equal in length.	T	R ✓	Rhombus
(d)	One pair of opposite sides is equal in length.	S	S ✓	Trapezium
(e)	All angles equal to 90° .	Q	T ✓	Kite

(4) Determine the value(s) of x , y and k in each of the following sketches. Also give complete reasons. What type of quadrilateral will $ABCD$ be?

(a)

Parallelogram

$y = 63^\circ$ [Opp. $\angle^s$ of parm]

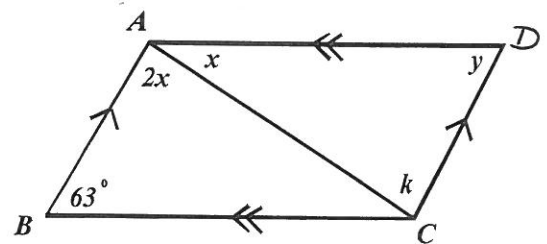
$2x + x + 63^\circ = 180^\circ$ [co-int $\angle^s$; $AD \parallel BC$]

$\therefore 3x = 180^\circ - 63^\circ = 117^\circ$

$\therefore x = \frac{117^\circ}{3} = 39^\circ$

$k = 180^\circ - 39^\circ - 63^\circ$ [int. $\angle^s$ of Δ]

$\therefore k = 78^\circ$



(b)

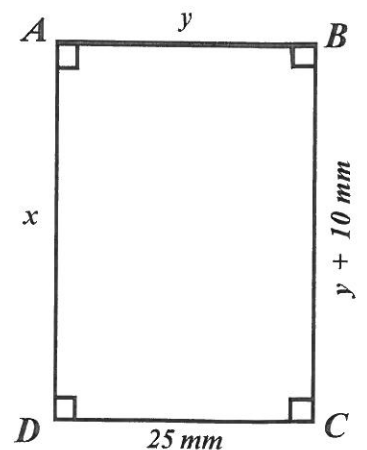
Rectangle

$y = 25 \text{ mm}$ [opp. sides rectangle]

$\therefore BC = y + 10$

$= 25 + 10 = 35 \text{ mm}$

$\therefore x = 35 \text{ mm}$ [opp. sides rectangle]



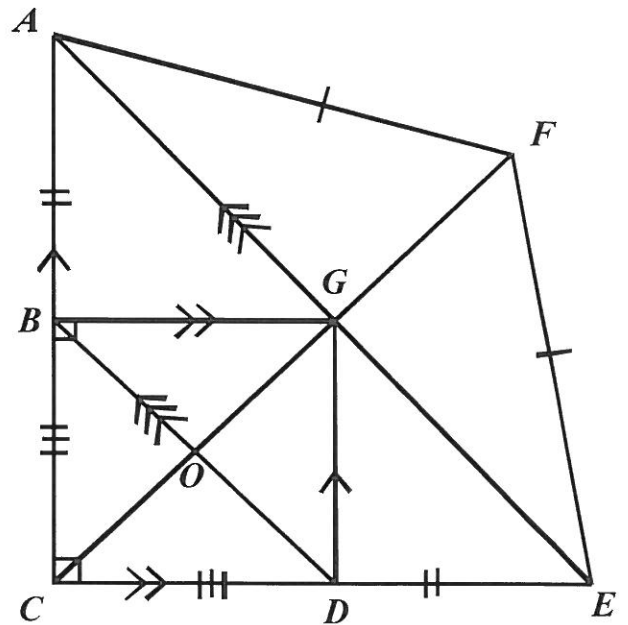
(5) Study the sketch and answer the questions:

(a) Write an example from the sketch of a:

- (i) trapezium
- (ii) parallelogram, which will not be a rectangle
- (iii) kite
- (iv) square
- (v) rectangle
- (vi) isosceles triangle

(b) Write down ten right-angled Δ s.

(c) If $FE = 10$ cm and $GF = 6$ cm, calculate the length of AE .



(a)(i) $\triangle ABOG$ or $\triangle OGD E$ or $\triangle ABDE$ or $\triangle BCEG$ or $\triangle GDC A$

(ii) $\triangle AGDB$ or $\triangle BGED$

(iii) $\triangle AFE C$

(iv) $\triangle BCD G$

(v) $\triangle BCD G$

(vi) $\triangle AFE$ or $\triangle BCD$ or $\triangle BGD$ or $\triangle ACE$ or $\triangle BCG$ or $\triangle CDG$

(b) $\triangle BGG$ $\triangle CDG$ $\triangle BDG$

$\triangle BCD$ $\triangle BCG$ $\triangle BGO$

$\triangle DOG$ $\triangle COD$ $\triangle ACE$

$\triangle ABG$ $\triangle GDE$

$\triangle EFG$ and $\triangle AGF$ (diagonals of kite $\perp$)
[Any 10]

(c) $EF^2 = GF^2 + GE^2$ [Pythagoras]

$$(10)^2 = (6)^2 + GE^2$$

$$\therefore GE^2 = 100 - 36 = 64$$

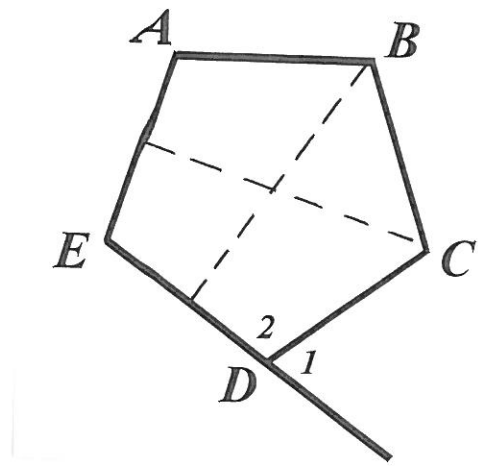
$$\therefore GE = \sqrt{64} = 8$$

$$\therefore AE = 16 \text{ cm } [AE = 2 \times GE]$$

$\rightarrow$ Diagonals of kite

(6) The sketch illustrates a regular polygon.

- (a) Calculate the sizes of $\hat{D}_1$ and $\hat{D}_2$.
Show all calculations.
- (b) If the lengths of AB, BC, CD, DE and AE are doubled, how will that influence the sizes of $\hat{D}_1$ and $\hat{D}_2$?
- (c) Name this specific polygon.
- (d) Draw any line (only one) of symmetry in on the sketch, if it is possible.



$$\begin{aligned} (a) \quad \hat{D}_2 &= [180^\circ \times (n-2)] \div n \\ &= [180^\circ \times (5-2)] \div 5 \\ &= 540^\circ \div 5 \end{aligned}$$

$$\therefore \hat{D}_2 = 108^\circ$$

$$\therefore \hat{D}_1 = 180^\circ - 108^\circ \quad [\angle^s \text{ on str. line}]$$

$$\therefore \hat{D}_1 = 72^\circ$$

(b) $\hat{D}_1$ and $\hat{D}_2$ stays the same

(c) Pentagon

(d) See 2 possible lines of symmetry on sketch.