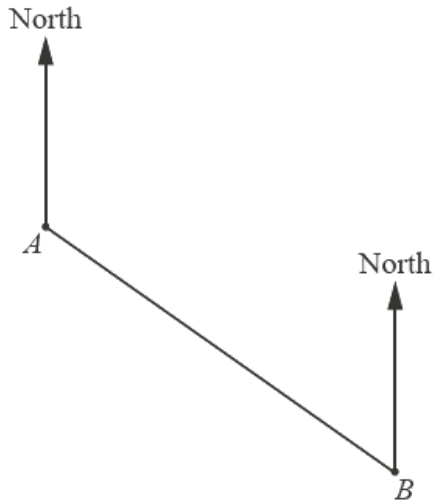


**Geometry – 2022 O Level Math D 4024**

1. Nov/2022/Paper\_4024/11/No.4



**Scale: 1 cm to 30 m**

The diagram shows the position of two ships, *A* and *B*.  
On the diagram 1 cm represents 30 m.

(a) Find, by measurement, the actual distance of *B* from *A*.

..... m [2]

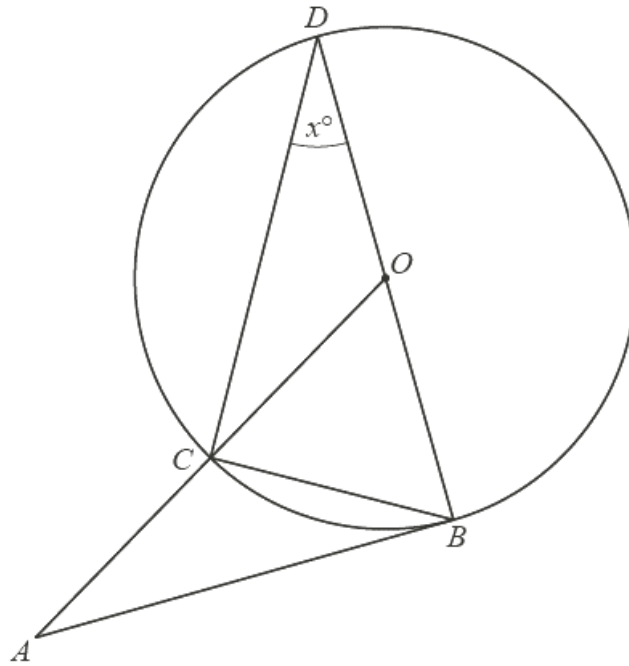
(b) Measure the bearing of *B* from *A*.

..... [1]

(c) A third ship is positioned at *C*.  
*C* is on a bearing of  $164^\circ$  from *A* and on a bearing of  $252^\circ$  from *B*.

Find and label the position of *C* on the diagram. [2]

## 2. Nov/2022/Paper\_4024/11/No.14

NOT TO  
SCALE

$B$ ,  $C$  and  $D$  are points on the circumference of a circle, centre  $O$ .  
 $AB$  is a tangent to the circle at  $B$ .  
 $BD$  is a diameter and  $OCA$  is a straight line.  
 $\hat{CDB} = x^\circ$ .

Find an expression, in terms of  $x$ , for each of the following.  
 Write each expression in its simplest form.

(a)  $\hat{COB}$ 

$$\hat{COB} = \dots\dots\dots [1]$$

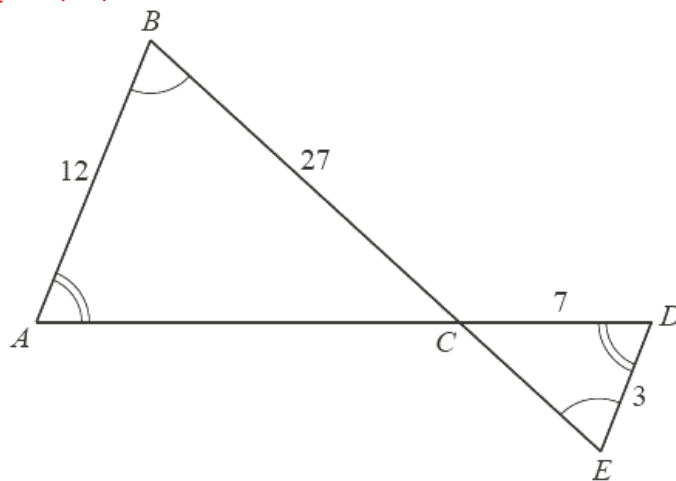
(b)  $\hat{OAB}$ 

$$\hat{OAB} = \dots\dots\dots [2]$$

(c)  $\hat{CBO}$

$$\hat{CBO} = \dots\dots\dots [2]$$

3. Nov/2022/Paper\_4024/11/No.15



NOT TO  
SCALE

Triangle  $ABC$  is mathematically similar to triangle  $DEC$ .  
 $AB = 12$  cm,  $BC = 27$  cm,  $CD = 7$  cm and  $DE = 3$  cm.

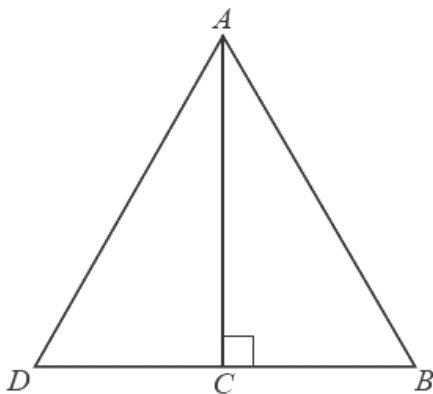
(a) Calculate  $AC$ .

..... cm [2]

(b) Given that the area of triangle  $ABC$  is  $160$  cm<sup>2</sup>, calculate the area of triangle  $DEC$ .

..... cm<sup>2</sup> [2]

## 4. Nov/2022/Paper\_4024/11/No.19



$ABD$  is an equilateral triangle.

$C$  lies on  $DB$  and  $AC$  is perpendicular to  $DB$ .

Show that triangle  $ADC$  is congruent to triangle  $ABC$ .

Give a reason for each statement you make.

.....

.....

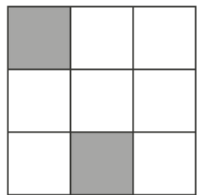
.....

.....

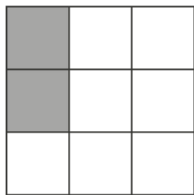
[3]

5. Nov/2022/Paper\_4024/12/No.4

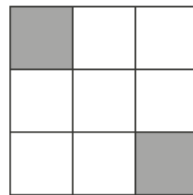
Sam has six square tiles labelled *A*, *B*, *C*, *D*, *E* and *F*.



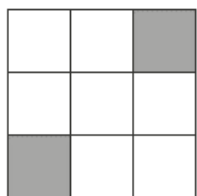
*A*



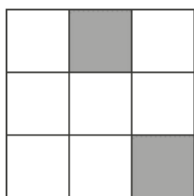
*B*



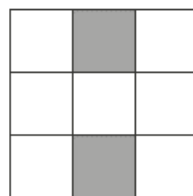
*C*



*D*

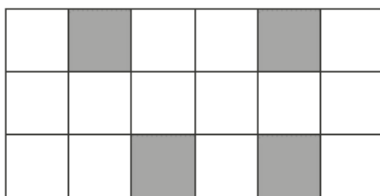


*E*



*F*

When Sam places tiles *E* and *F* side by side the resulting rectangle has no lines of symmetry and no rotational symmetry.



*E*

*F*

Write down the two tiles that Sam should place side by side to make a rectangle that has

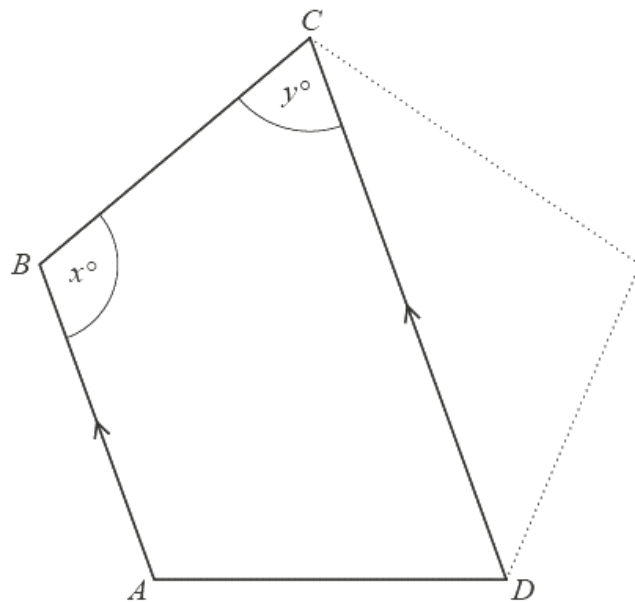
(a) one line of symmetry only,

..... [1]

(b) rotational symmetry of order 2.

..... [1]

6. Nov/2022/Paper\_4024/12/No.7

NOT  
TO  
SCALE

In the diagram,  $AD$ ,  $AB$  and  $BC$  are three sides of a regular pentagon and  $DC$  is a diagonal of the pentagon.  
 $AB$  is parallel to  $DC$ .

(a) Find the value of  $x$ .

$$x = \dots\dots\dots [2]$$

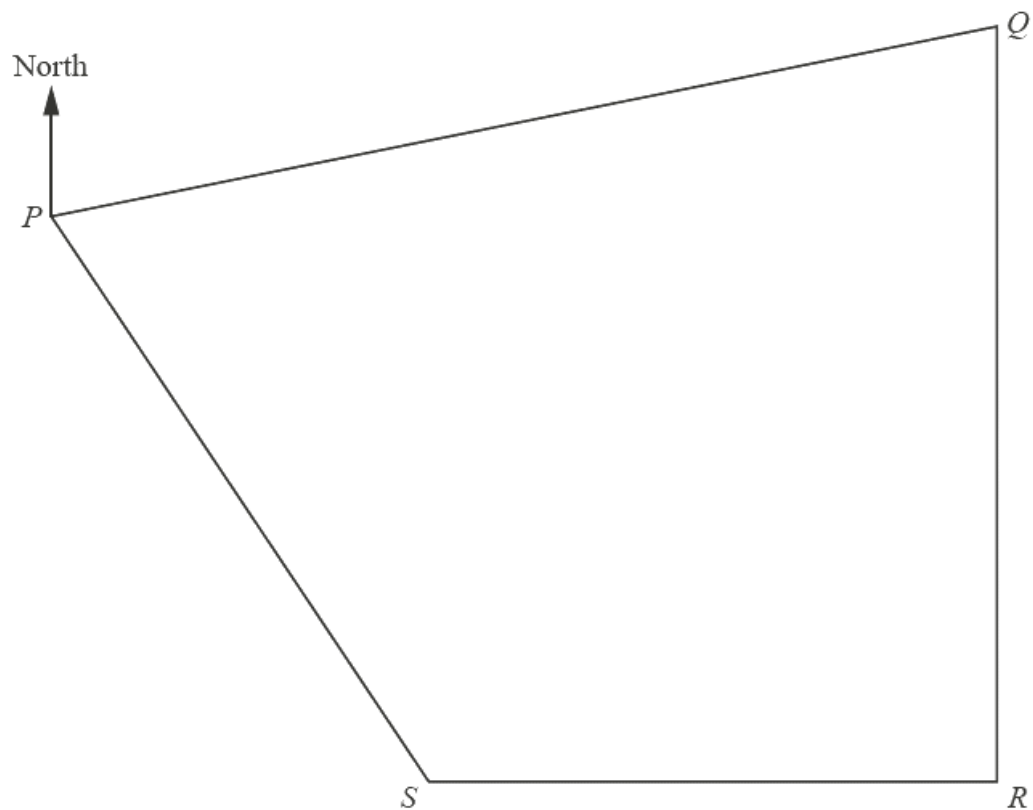
(b) Find the value of  $y$ .

$$y = \dots\dots\dots [1]$$

## 7. Nov/2022/Paper\_4024/12/No.14

The scale drawing shows a plot of land,  $PQRS$ .

The scale is 1 cm to 20 m.



Scale: 1 cm to 20 m

- (a) A path crosses the land.  
The path is equidistant from  $SP$  and  $SR$ .  
Use a straight edge and compasses only to construct the path.

[2]



(b) Priya walks from point  $P$  to the path on a bearing of  $104^\circ$ .

(i) Draw a line to represent Priya's walk.

[1]

(ii) Find the actual distance from  $P$  to where Priya meets the path.

..... m [2]

(c) A car park is to be built on the plot of land.

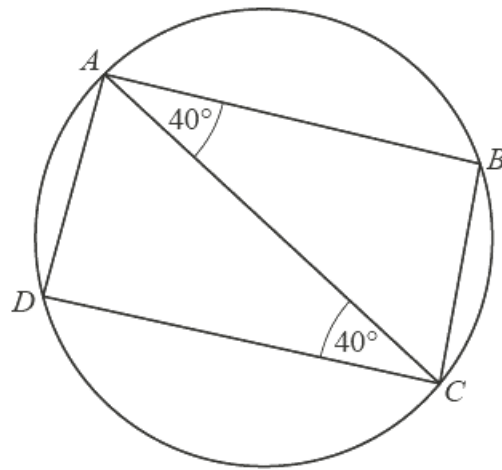
On the scale drawing the area of the car park will be  $2 \text{ cm}^2$ .

Find the actual area of the car park.

.....  $\text{m}^2$  [2]

8. Nov/2022/Paper\_4024/22/No.10

(a)



NOT TO SCALE

$A, B, C$  and  $D$  are points on a circle.  
 $AC$  is a diameter of the circle.  
 $\hat{ACD} = \hat{CAB} = 40^\circ$ .

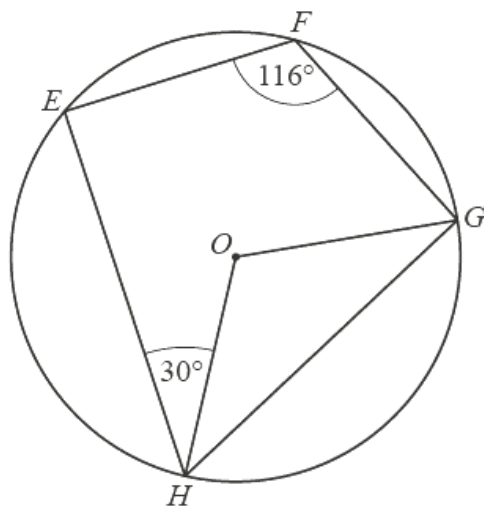
- (i) Show that triangle  $ABC$  is congruent to triangle  $CDA$ .  
 Give a reason for each statement you make.

.....  
 .....  
 .....  
 ..... [3]

- (ii) Explain why  $ABCD$  is a rectangle.

.....  
 .....  
 ..... [2]

(b)

NOT TO  
SCALE

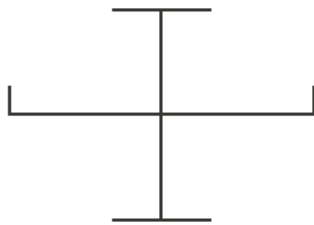
$E, F, G$  and  $H$  are points on a circle with centre  $O$  and radius 6 cm.  
 $\widehat{EHO} = 30^\circ$  and  $\widehat{EFG} = 116^\circ$ .

Calculate the shaded area.

.....  $\text{cm}^2$  [5]

## 9. June/2022/Paper\_4024/11/No.2

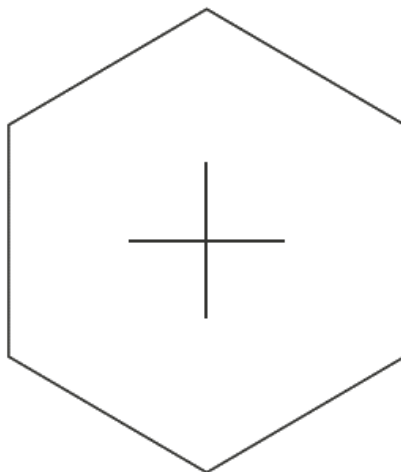
(a)



Write down the number of lines of symmetry of this diagram.

..... [1]

(b)

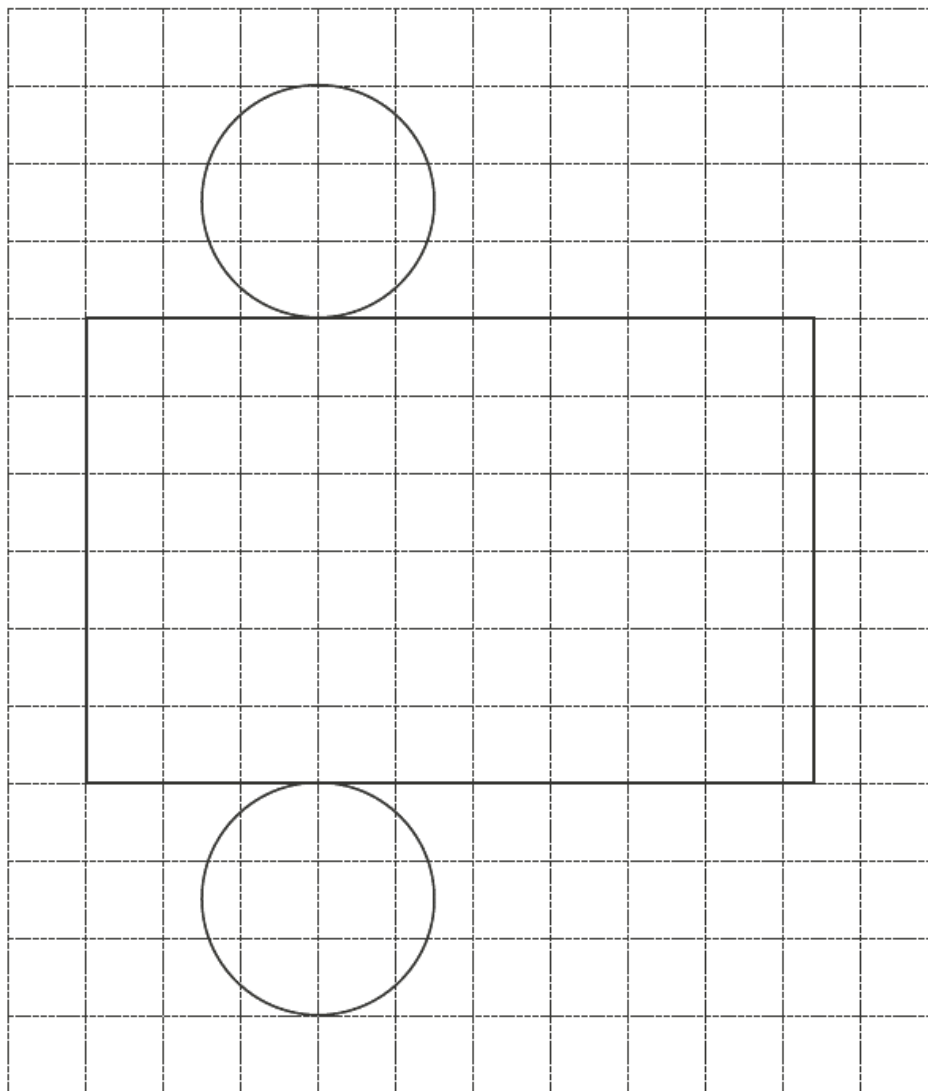


Write down the order of rotational symmetry of this diagram.

..... [1]

10. June/2022/Paper\_4024/11/No.5

The diagram shows the net of a solid drawn on a 1 cm grid.



Name the solid formed by this net and describe fully the dimensions of this solid.

Name of solid .....

Dimensions ..... [3]

**11. June/2022/Paper\_4024/11/No.17**

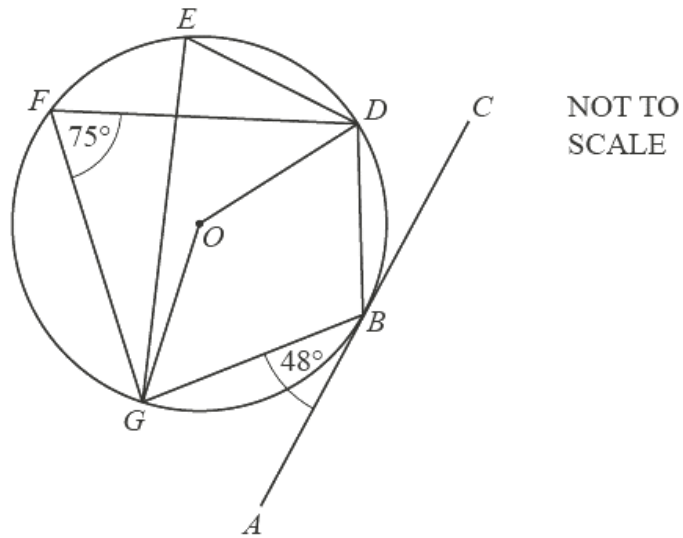
The scale of a map is 2 cm to 1 km.

The area of a wood on the map is  $6 \text{ cm}^2$ .

Calculate the actual area of the wood in  $\text{km}^2$ .

.....  $\text{km}^2$  [2]

12. June/2022/Paper\_4024/11/No.19



$B, D, E, F$  and  $G$  are points on the circumference of a circle centre  $O$ .  
 $AC$  is a tangent to the circle at  $B$ .  
 Angle  $DFG = 75^\circ$  and angle  $ABG = 48^\circ$ .

(a) Find angle  $DEG$ .

Angle  $DEG = \dots\dots\dots$  [1]

(b) Find angle  $DOG$ .

Angle  $DOG = \dots\dots\dots$  [1]

(c) Find angle  $DBC$ .

Angle  $DBC = \dots\dots\dots$  [2]

13. June/2022/Paper\_4024/12/No.5

The scale drawing shows the positions of two villages, *A* and *B*.  
The scale is 1 cm to 2 km.



Scale: 1 cm to 2 km

(a) Find the actual distance between village *A* and village *B*.

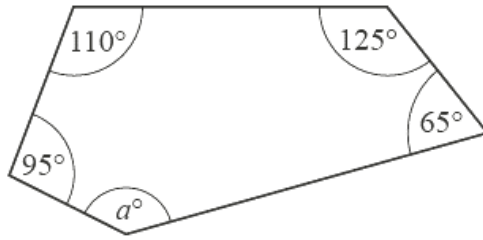
..... km [2]

(b) Measure the bearing of *B* from *A*.

..... [1]



14. June/2022/Paper\_4024/12/No.8

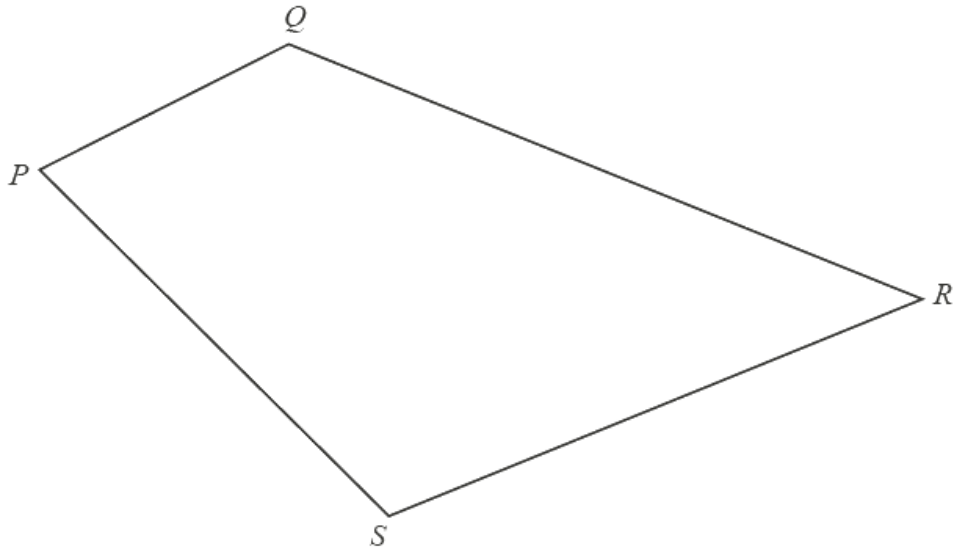
NOT TO  
SCALE

The diagram shows a pentagon.

Find the value of  $a$ .

$a = \dots\dots\dots$  [3]

15. June/2022/Paper\_4024/12/No.11



(a) Use a straight edge and compasses only to construct the bisector of angle  $PSR$ . [2]

(b) Point  $X$  lies inside quadrilateral  $PQRS$  and is closer to  $PS$  than to  $RS$ .

Shade the region in which  $X$  must lie. [1]

16. June/2022/Paper\_4024/12/No.17

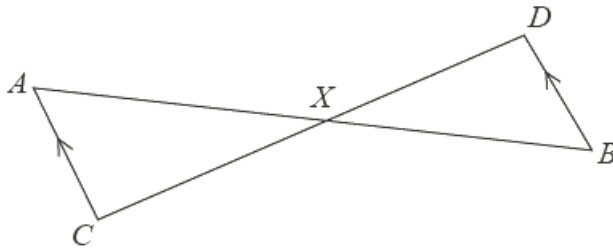
(a) Ryan says:

Each diagonal of quadrilateral  $Q$  divides it into two congruent isosceles triangles.

Draw a ring around each of the quadrilaterals in the list for which Ryan's statement is always true.

Square      Rectangle      Rhombus      Parallelogram      Trapezium      Kite      [1]

(b)



NOT TO SCALE

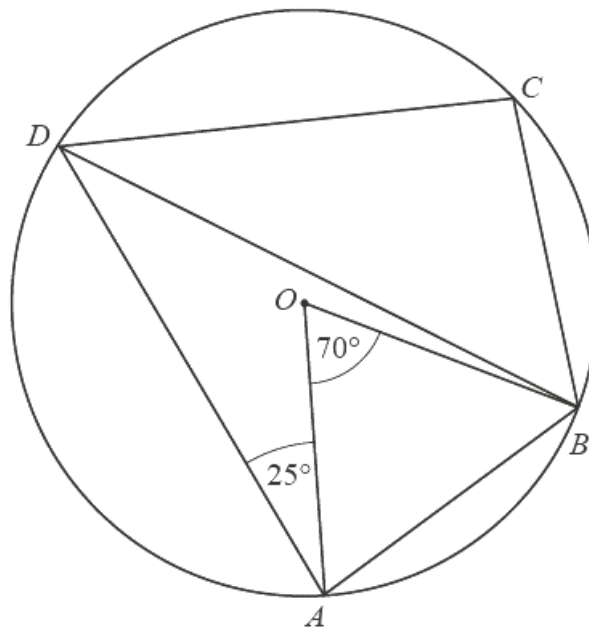
$AXB$  and  $CXD$  are straight lines.  
 $X$  is the midpoint of  $AB$ .  
 $AC$  is parallel to  $DB$ .

Show that triangle  $AXC$  is congruent to triangle  $BXD$ .  
 Give a reason for each statement you make.

.....  
 .....  
 .....  
 .....

[3]

17. June/2022/Paper\_4024/12/No.20

NOT TO  
SCALE

$A, B, C$  and  $D$  are points on the circle, centre  $O$ .

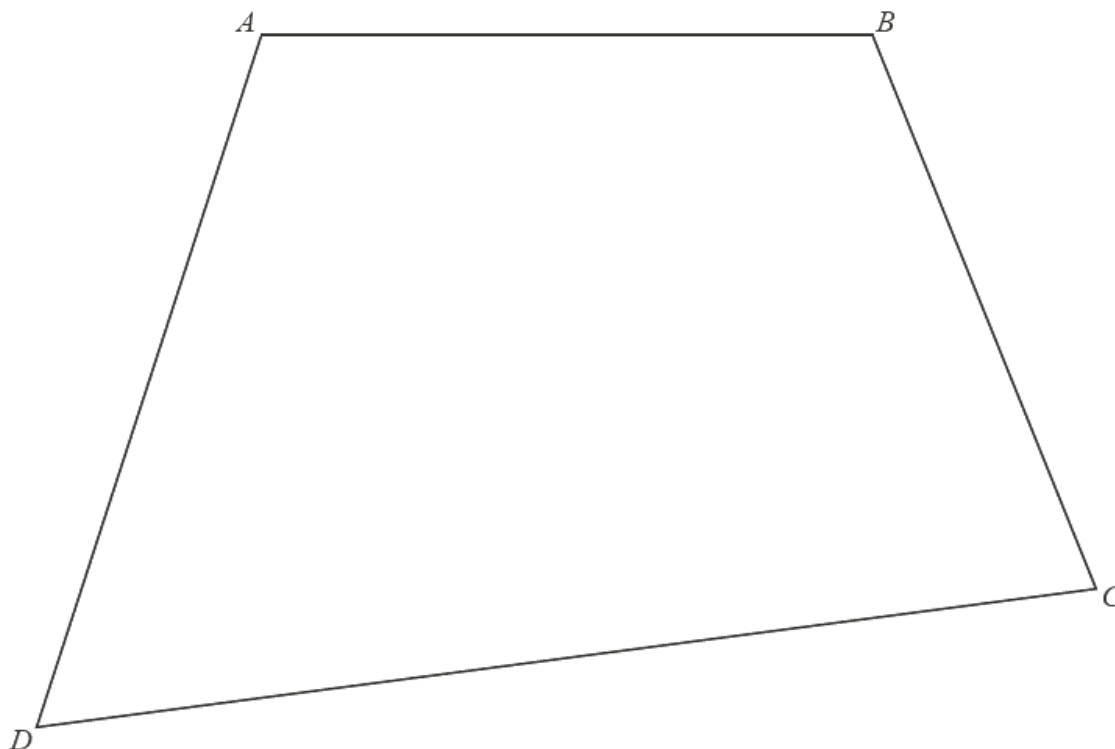
(a) Find  $\hat{ADB}$ .

$$\hat{ADB} = \dots\dots\dots [1]$$

(b) Find  $\hat{BCD}$ .

$$\hat{BCD} = \dots\dots\dots [2]$$

18. June/2022/Paper\_4024/21/No.6



Scale: 1 cm to 50 m

The diagram shows a field,  $ABCD$ , drawn to a scale of 1 cm to 50 m.

(a) The field has a straight path from  $D$  to the midpoint of  $AB$ .

Draw the path and measure the angle the path makes with  $DC$ .

..... [2]

(b) Grass is to be planted on an area of the field.

The area to be planted is to be

- less than 325 m from  $B$
  - nearer to  $CB$  than  $CD$
- and
- can only be on one side of the path.

By drawing appropriate loci, find and shade the largest possible area for the grass to be planted. [4]

(c) Find the **actual** length of the part of the path that forms a boundary for the grass.

..... m [1]