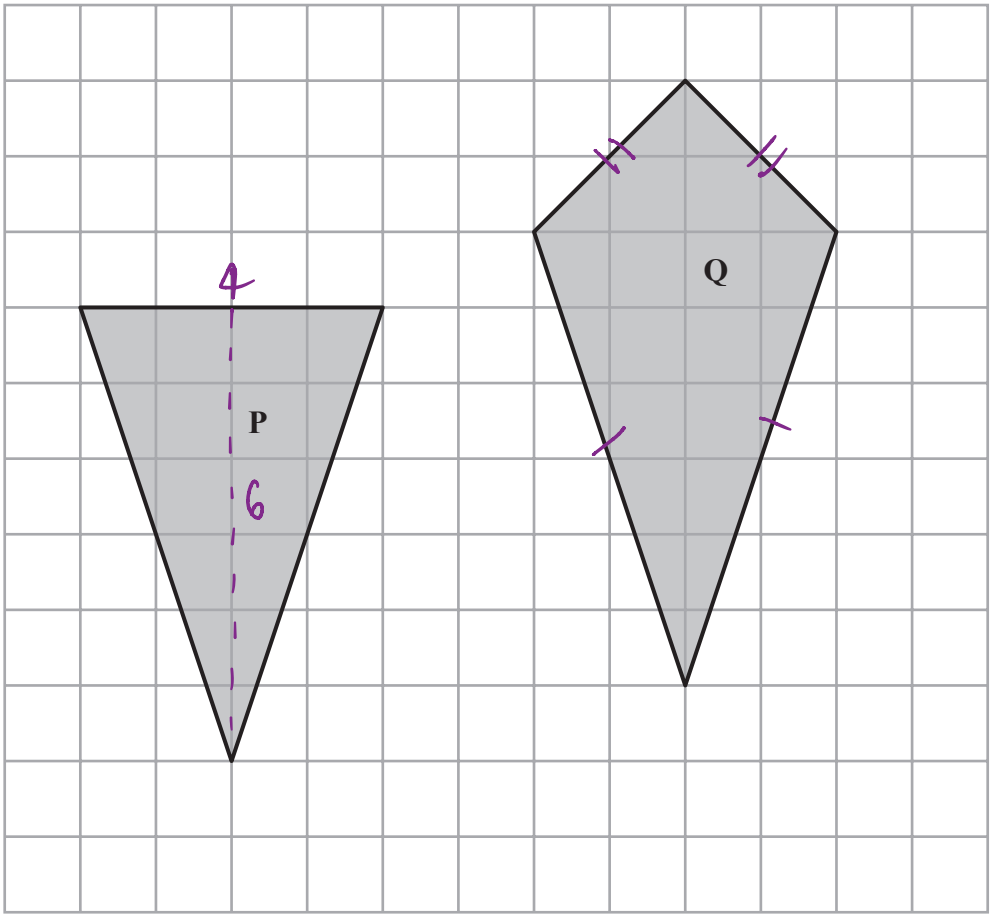
1. The diagram shows two shapes drawn on a centimetre grid.



(a) Find the area of shape **P**.

area of triangle = $\frac{1}{2}bh$

$\frac{1}{2} \times 4 \times 6 = 12$

12 cm²

(2)

(b) Write down the mathematical name of quadrilateral **Q**.

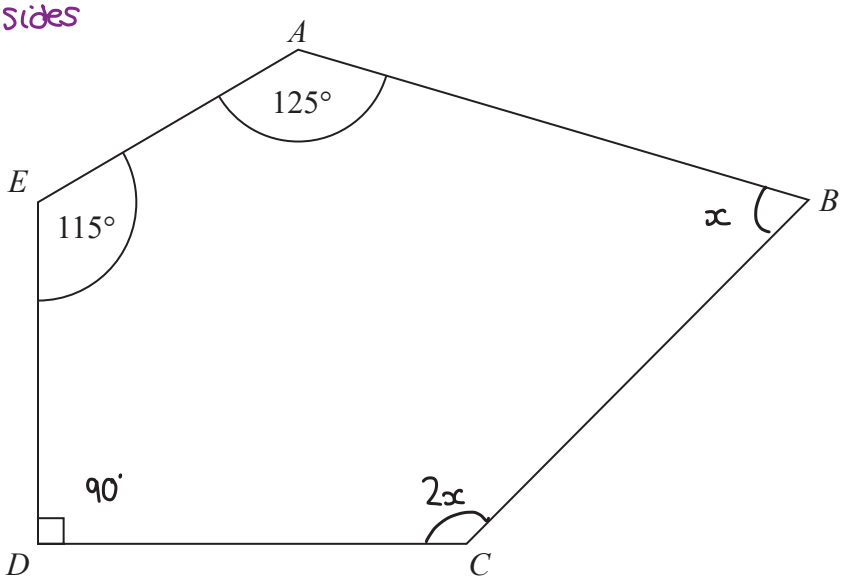
Kite

(1)

(Total for Question is 3 marks)

2. *ABCDE* is a pentagon.

5 sides



Angle *BCD* = 2 × angle *ABC*

Work out the size of angle *BCD*.
You must show all your working.

Let $\angle ABC = x$ $\therefore$ $\angle BCD = 2x$

Sum of interior angles of a pentagon:

number of sides

$(n-2)\times 180 = (5-2)\times 180$ (1)

$= 180\times 3$

$= 540°$ (1)

Setting up an equation in x:

$x + 2x + 90 + 115 + 125 = 540$ (1)

$3x = 210$ (1)

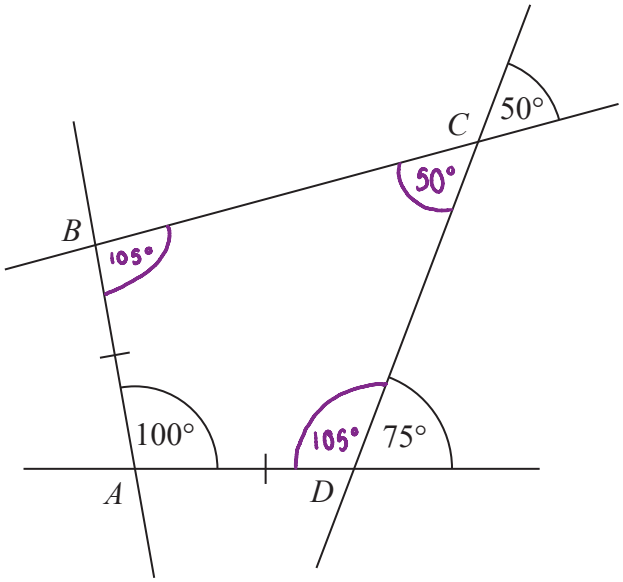
$x = 70°$

$\angle BCD = 2x = 2\times 70 = 140°$

140 (1) °

(Total for Question is 5 marks)

3. The diagram shows quadrilateral $ABCD$ with each of its sides extended.



$AB = AD$

Show that $ABCD$ is a kite.
Give a reason for each stage of your working.

$\angle BCD = 50°$ ✓
Because vertically opposite angles are equal

$\angle ADC = 180 - 75$
$= 105°$ ✓
Because angles on a straight line add to 180°

$\angle ABC + 100 + 105 + 50 = 360$
$\angle ABC = 105°$ ✓
Because angles in a quadrilateral add to 360°

$\therefore$ ABCD is a kite because it has two equal side lengths and two equal angles ✓

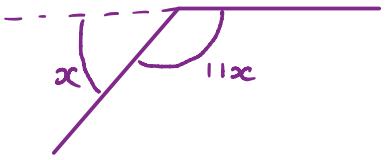
(Total for Question is 4 marks)

4. The size of each interior angle of a regular polygon is 11 times the size of each exterior angle.

Work out how many sides the polygon has.

Let x be the exterior angle

Interior angle is $11x$



$x + 11x = 180$ ✓

$12x = 180$

$(\div 12)$ $(\div 12)$

$x = 15°$

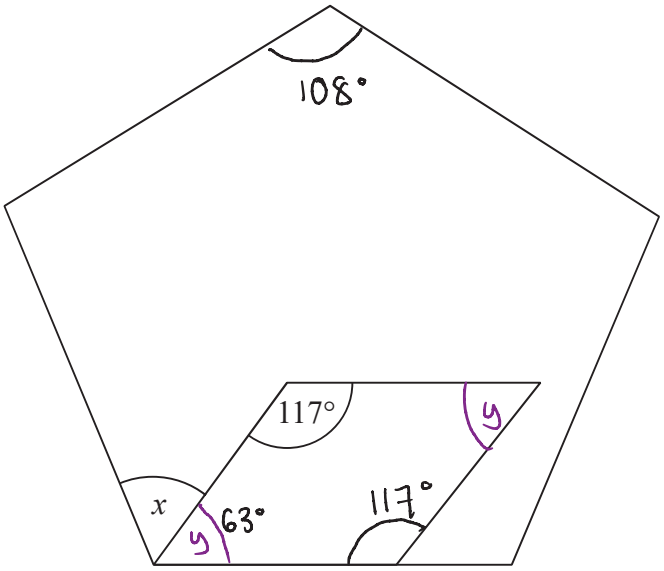
All exterior angles on a regular polygon add to 360°

$\frac{360}{15} = 24$ ✓

24 ✓

(Total for Question is 3 marks)

5. The diagram shows a regular pentagon and a parallelogram.



Work out the size of the angle marked x.
You must show all your working.

Sum of interior angles = (n° of sides − 2) × 180
= (5 − 2) × 180
= 3 × 180
= 540°

$\frac{540}{5} = 108°$

In parallelograms opposite angles are equal

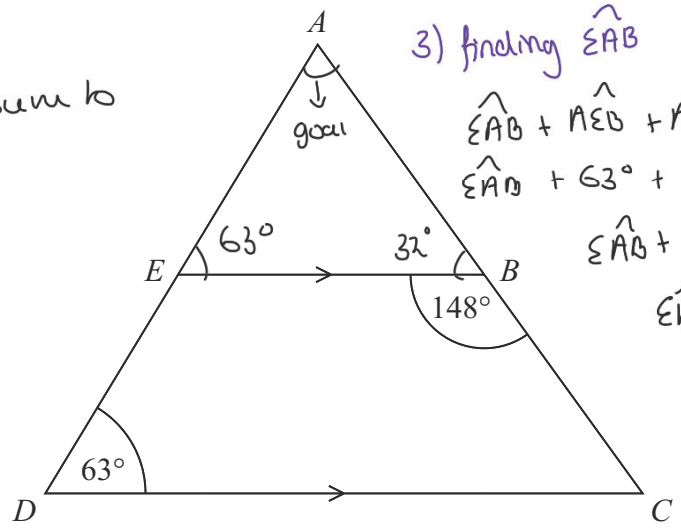
$117 + 117 + 2y = 360$
$234 + 2y = 360$
$(-234) \quad (-234)$
$2y = 126$
$(\div 2) \quad (\div 2)$
$y = 63°$

$x + y = 108°$
$x + 63 = 108$
$(-63) \quad (-63)$
$x = 45°$

45 °

(Total for Question is 4 marks)

6. *ADC* is a triangle.



Angles in a triangle sum to 180°. ✓5

3) finding $\hat{EAB}$

$\hat{EAB} + \hat{AEB} + \hat{ABE} = 180°$

$\hat{EAB} + 63° + 32° = 180°$ ✓2

$\hat{EAB} + 95° = 180°$

$\hat{EAB} = 180° - 95°$

$= 85°$

AED and *ABC* are straight lines.
EB is parallel to *DC*.

Angle *EBC* = 148°
Angle *ADC* = 63°

Work out the size of angle *EAB*.
You must give a reason for each stage of your working.

1) finding angle $\hat{AEB}$.

$\hat{AEB}$ and $\hat{ADC}$ are corresponding angles (AE is on the line AED and EB and DC are parallel).

↳ $\hat{AEB} = \hat{ADC}$ → $\hat{AEB} = 63°$ ✓1

2) finding angle $\hat{ABE}$.

Line ABC is a straight line, and angles on a line sum to 180° ✓4

$\hat{ABE} + \hat{EBC} = 180°$

148° ↓ $\hat{ABE} + 148° = 180°$ ↓ −148°

$\hat{ABE} = 180° - 148°$

$\hat{ABE} = 32°$ ✓2

$\therefore \hat{EAB} = 85°$ ✓3

(Total for Question is 5 marks)

7. Each exterior angle of a regular polygon is 15°

Work out the number of sides of the polygon.

$\frac{360^\circ}{n}$ = size of exterior angle (θ) → $\frac{360^\circ}{n} = \theta^\circ$ ✓1

$\times n$ ↓ $360^\circ = n\theta^\circ$ ↓ $\times n$

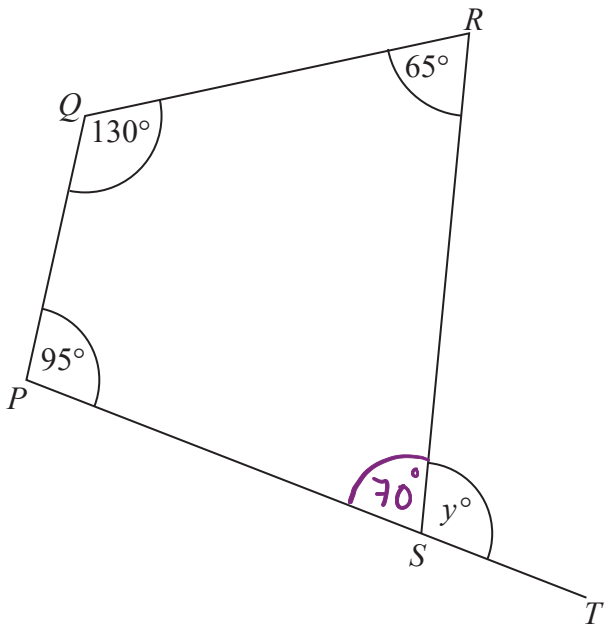
θ° ↓ $n = \frac{360^\circ}{\theta^\circ}$ ↓ $\div \theta^\circ$

$n = \frac{360^\circ}{15^\circ} = 24$

24 ✓2

(Total for Question is 2 marks)

8. *PQRS* is a quadrilateral.
PST is a straight line.



Find the value of y.

Angles in a quadrilateral add up to 360°

$95 + 130 + 65 + x = 360°$ (1)

$\therefore x = 360 - 65 - 130 - 95 = 70°$

Angles on a straight line add up to 180°

$x + y = 180°$ (1)

$70 + y = 180°$

$y = 180° - 70° = 110°$ (1)

$y =$ 110° .....

(Total for Question is 3 marks)