1 Here is a 10-sided polygon.

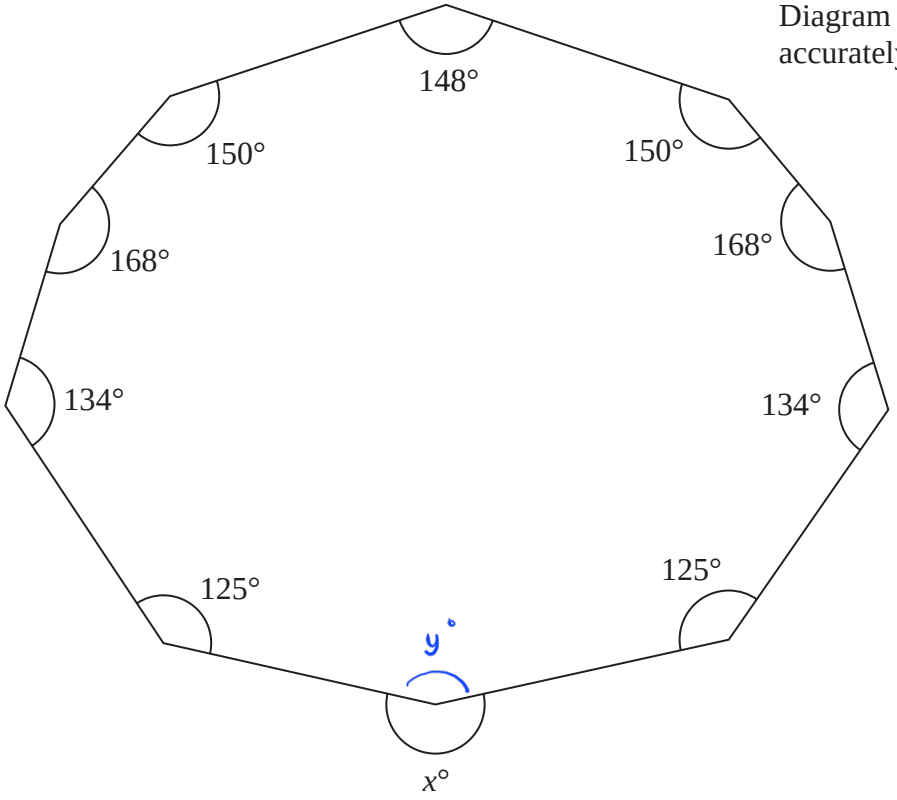

Diagram **NOT** accurately drawn

Work out the value of x.

angle inside polygon : $(n-2) \times 180^\circ$

$: (10-2) \times 180^\circ = 1440^\circ$ (1)

$125^\circ + 134^\circ + 168^\circ + 150^\circ + 148^\circ + 150^\circ + 168^\circ + 134^\circ + 125^\circ + y^\circ = 1440^\circ$

$y^\circ = 1440^\circ - 1302^\circ$

$= 138^\circ$ (1)

$\therefore x^\circ = 360^\circ - y^\circ$

$: 360^\circ - 138^\circ$ (1)

$: 222^\circ$ (1)

$x =$ 222°

(Total for Question 1 is 4 marks)

2 The diagram shows cuboid *ABCDEFGH*.

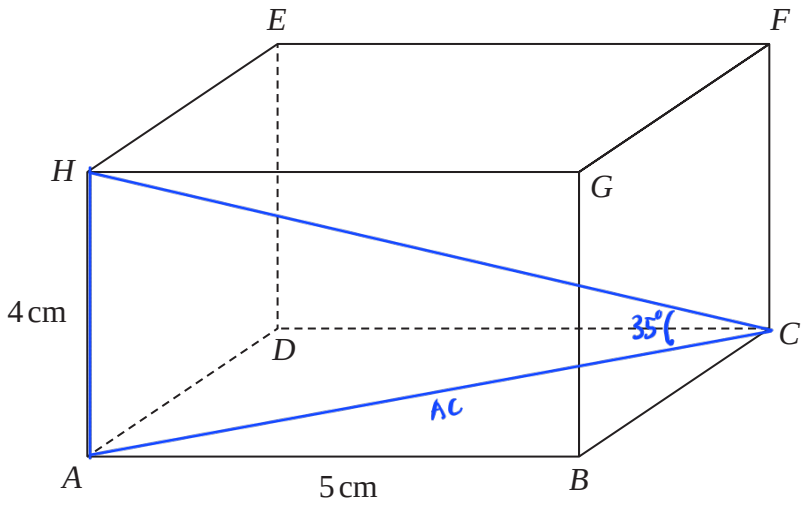

Diagram **NOT** accurately drawn

AB = 5 cm
AH = 4 cm
The size of the angle between *CH* and the plane *ABCD* is 35°

Calculate the volume of the cuboid.
Give your answer correct to 3 significant figures.

① Find length BC

② Volume = $4 \times 5 \times BC$

$\tan 35^\circ = \frac{4\text{ cm}}{AC}$ (1)

$AC = \frac{4\text{ cm}}{\tan 35^\circ}$

$= 5.71\text{ cm}$ (1)

$AC^2 = AB^2 + BC^2$

$BC^2 = AC^2 - AB^2$

$BC^2 = 5.71^2 - 5^2$

$BC = \sqrt{5.71^2 - 5^2}$ (1)

$= 2.76\ldots$

Volume of cuboid : $4 \times 5 \times 2.76$ (1)

$= 55.3$ (1)

55.3 ..... cm^3

(Total for Question 2 is 5 marks)

3 The diagram shows a rectangle and a diagonal of the rectangle.

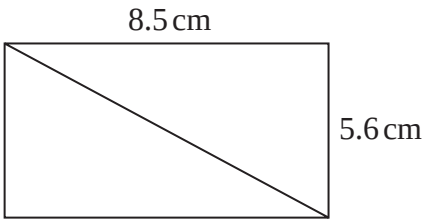

Diagram **NOT** accurately drawn

Work out the length of the diagonal of the rectangle.
Give your answer correct to 1 decimal place.

Using Pythagoras' theorem:

diagonal $= \sqrt{8.5^2 + 5.6^2}$ (1)

$= \sqrt{103.61}$ (1)

$= 10.2$ (1)

10.2 ..... cm

(Total for Question 3 is 3 marks)

4 The diagram shows parts of three regular polygons, **A**, **B** and **C**, meeting at a point.

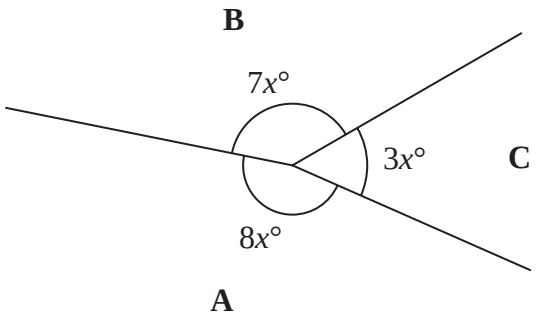

Diagram **NOT** accurately drawn

Polygon **B** has n sides.

Work out the value of n.

$7x + 3x + 8x = 360^\circ$ (1)

$18x = 360^\circ$

$x = 20^\circ$ (1)

$\frac{(n-2) \times 180^\circ}{n} = 7 \times 20^\circ$ (1)

$180^\circ n - 360^\circ = 140^\circ n$

$40^\circ n = 360^\circ$

$n = 9$ (1)

$n =$ 9

(Total for Question 4 is 4 marks)

5 The diagram shows a regular octagon *ABCDEFGH* and a regular pentagon *ABIJK*

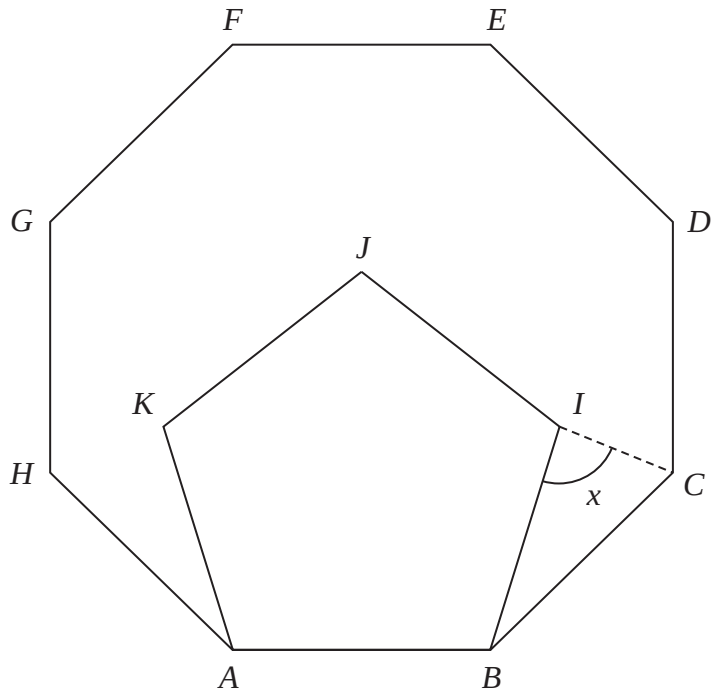

Diagram **NOT** accurately drawn

Work out the size of the angle *x*

Interior angle :

octagon : $180^\circ - (360 \div 8) = 135^\circ$ (1)

pentagon : $180^\circ - (360 \div 5) = 108^\circ$

$IBC = 135^\circ - 108^\circ$ (1)

$= 27^\circ$

since BCI is isosceles,

$x = \frac{180^\circ - 27^\circ}{2}$ (1)

$= 76.5^\circ$ (1)

76.5 °

(Total for Question 5 is 4 marks)

6 The diagram shows a regular 10-sided polygon, *ABCDEFGHIJ*

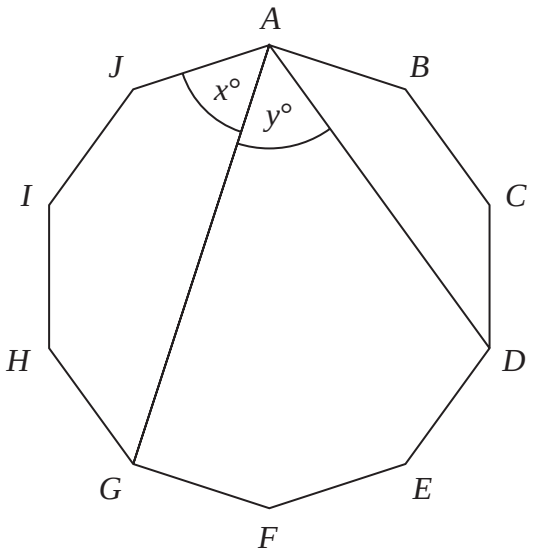

Diagram **NOT** accurately drawn

Show that $x = y$

Interior angle : $\frac{(10-2)\times 180^\circ}{10} = 144^\circ$ (1)

$x = \frac{540^\circ - 3(144^\circ)}{2} = 54^\circ$ (1)

$BAD = \frac{360^\circ - 2(144^\circ)}{2} = 36^\circ$ (1)

$y = 90^\circ - 36^\circ$

$= 54^\circ$ (1)

$\therefore y = x$

(Total for Question 6 is 4 marks)