**1** Jenna measures all the angles around a point.

Her results are 23°, 145°, 23° and 69°

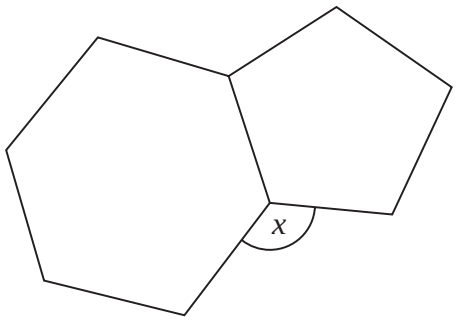
Explain why these results cannot be true.

The total angle does not add up to 360°. (1)

Total angle of a complete circle is always 360°.

**(Total for Question 1 is 1 mark)**

**2** Here is a regular hexagon and a regular pentagon.




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

Interior angle = $\frac{180}{n} \times (n-2)$, $n$ = number of sides

For hexagon, $n=6$

interior angle = $\frac{180}{6} \times (6-2)$

$= 30 \times 4$

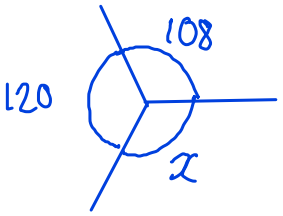
$= 120$ (1)

For pentagon, $n=5$

Interior angle = $\frac{180}{5} \times (5-2)$

$= 36 \times 3$

$= 108$




All add to 360, so

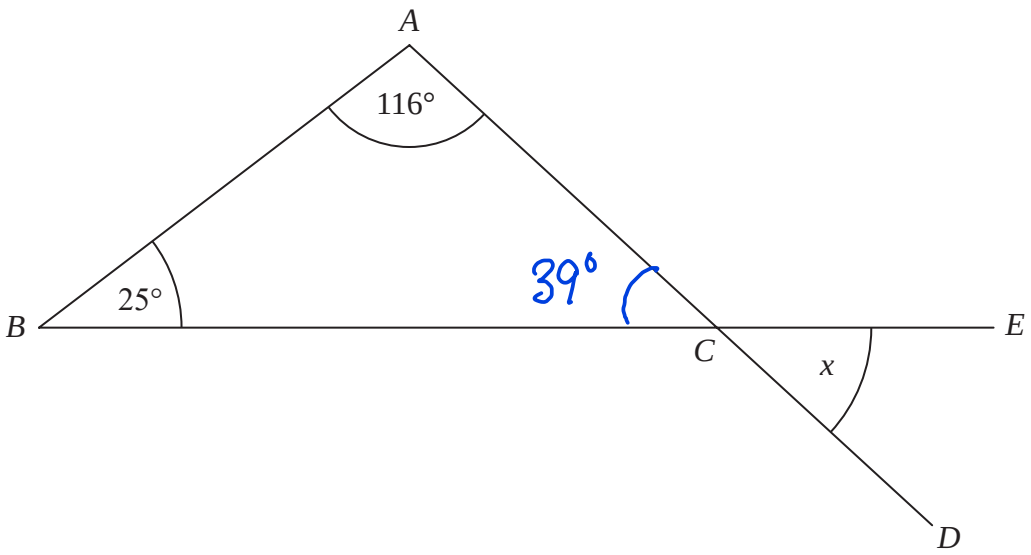
$x = 360 - (120 + 108)$ (1)

$= 132$ (1)

132 °

**(Total for Question 2 is 3 marks)**

**3** The diagram shows a triangle *ABC*.




*ACD* and *BCE* are straight lines.

Work out the size of the angle marked *x*.
Give a reason for each stage of your working.

$\angle ACB = 180 - (116 + 25) = 39$ (1) (angles in a triangle add up to 180°)

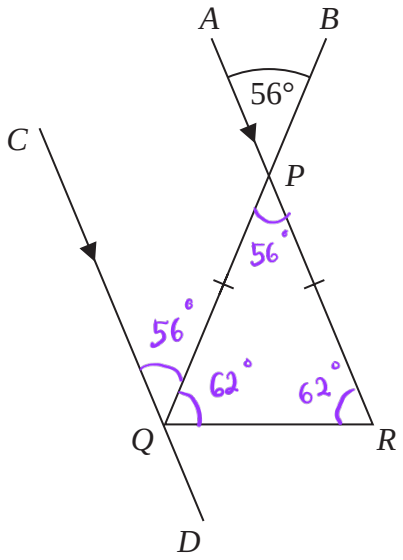
$x = 39°$ (1)

(opposite angles are equal) (1)

39 °

**(Total for Question 3 is 3 marks)**

**4** In the diagram, *PQR* is an isosceles triangle with *PQ* = *PR*.




*APR* and *CQD* are parallel lines.
*BPQ* is a straight line.

Angle *APB* = 56°

Work out the size of angle *CQR*.
Give a reason for each stage of your working.

angle QPR = angle APB = 56° (because opposite angles are equal) (1)
(1)

angle PQR = angle PRQ = $\frac{180° - 56°}{2}$

= 62° (because angle at the base of an isosceles triangle are equal) (1)

angle CQP = angle APB = 56° (because corresponding angles are equal)
(1)

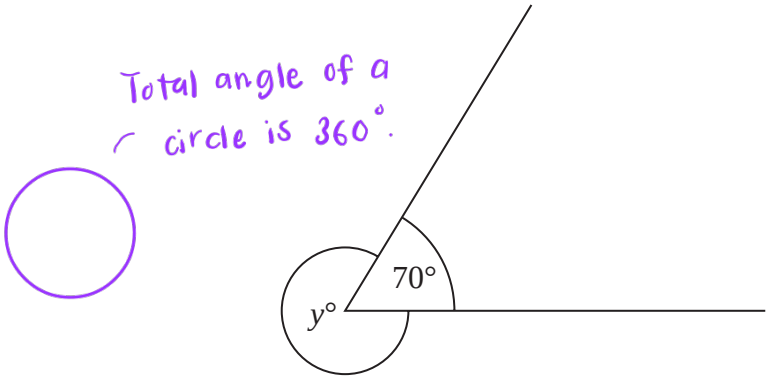
angle CQR = angle CQP + angle PQR

= 56° + 62°

= 118° (1)

**(Total for Question 4 is 5 marks)**

**5**




(a) Find the value of $y$.

$y = 360° - 70°$

$= 290°$ (1)

$y =$ 290° .....

**(1)**

(b) Give a reason for your answer.

Angles around a point adds up to 360°. (1)

.....

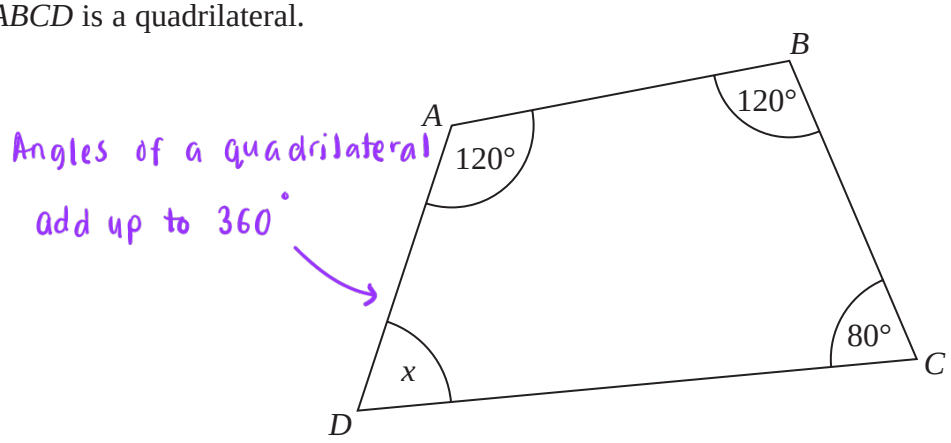
.....

.....

**(1)**

**(Total for Question 5 is 2 marks)**

**6** *ABCD* is a quadrilateral.




Angles of a quadrilateral add up to 360°

(a) (i) Work out the size of angle *x*.

$x = 360^\circ - 120^\circ - 120^\circ - 80^\circ$

$= 40^\circ$

40 (1) °

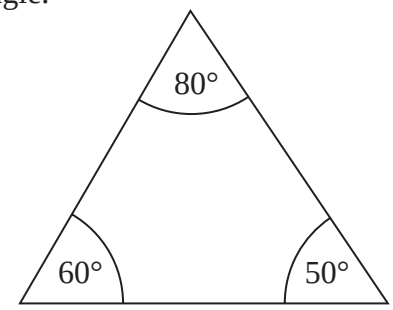
**(1)**

(ii) Give a reason for your answer.

Angles in a quadrilateral adds up to 360°. (1)

**(1)**

The diagram below shows a triangle.




The diagram is wrong.

(b) Explain why.

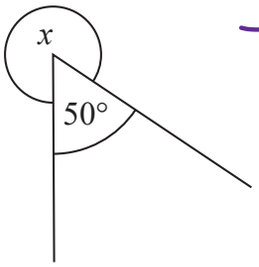
Total angle = $80^\circ + 60^\circ + 50^\circ = 190^\circ$.

Angle in a triangle only adds up to 180°. (1)

**(1)**

**(Total for Question 6 is 3 marks)**

**7**




→ a full circle minus the 50°

(a) Work out the size of the angle marked $x$.

$360° - 50° = 310$ ✓1

✓1

310 °

**(2)**

A student says that an angle of 50° is an obtuse angle.

The student is wrong.

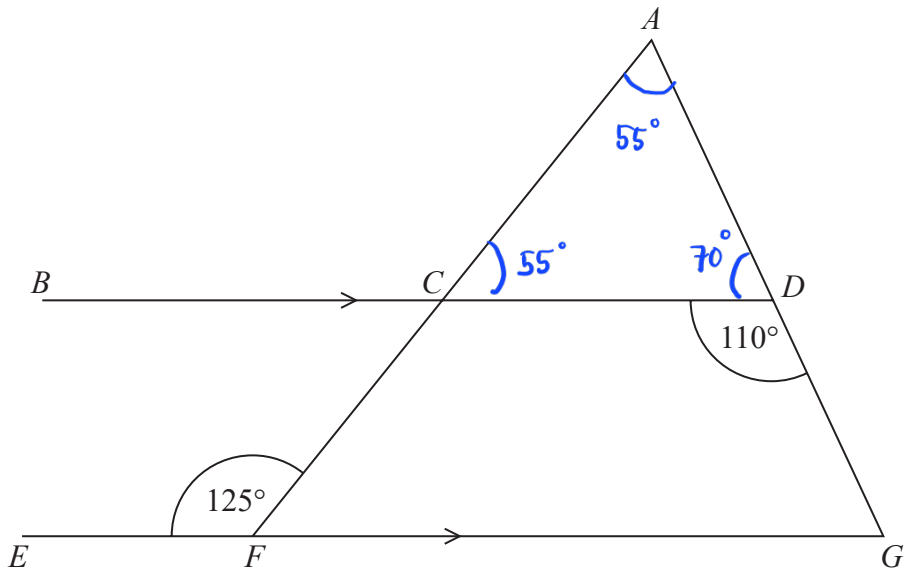
(b) Explain why.

obtuse angle has to be over 90 and less than 180° ✓1

**(1)**

**(Total for Question 7 is 3 marks)**

**8** *ACF* and *ADG* are straight lines.
*BCD* and *EFG* are parallel lines.



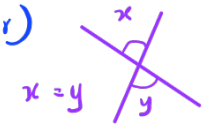

Show that triangle *ACD* is isosceles.
Give a reason for each stage of your working.

two base angles are equal

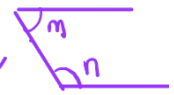
$\angle ADC = 180^\circ - 110^\circ = 70^\circ$ (1)
(because angles on a straight line add up to $180^\circ$) (1)




$\angle ACD = \angle BCF$ (because opposite angles are equal to each other)




$\angle BCF = 180^\circ - \angle EFC$
$= 180^\circ - 125^\circ = 55^\circ$ (1)
(because co-interior angles add up to $180^\circ$) (1)




$\angle CAD = 180^\circ - \angle ADC - \angle ACD$ (because angles in triangle adds up to $180^\circ$)
$= 180^\circ - 70^\circ - 55^\circ$
$= 55^\circ$

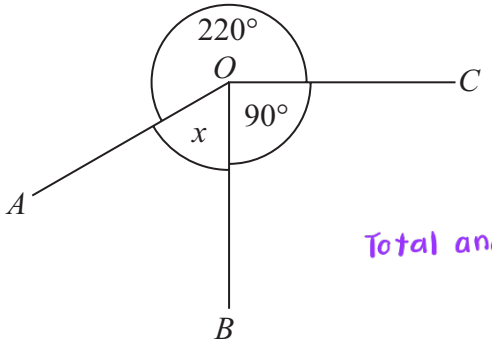



$\angle ACD = \angle CAD = 55^\circ$ (1)

$\therefore$ triangle ACD is an isosceles

**(Total for Question 8 is 5 marks)**

**9** *OA*, *OB* and *OC* are three straight lines.




Total angle around a point = 360°

360
- 220
140
- 90
50

(i) Work out the size of the angle marked *x*.

$x = 360^\circ - 220^\circ - 90^\circ$ (1)

$= 50^\circ$ (1)

50 °

(2)

(ii) Give a reason for your answer.

Angles at a point add up to 360° (1)

(1)

**(Total for Question 9 is 3 marks)**