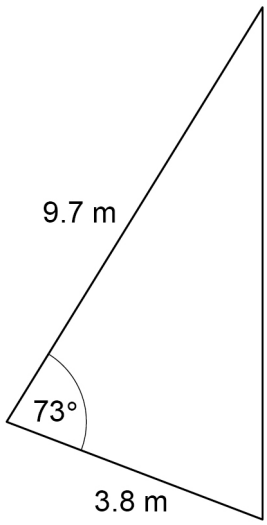
1 Here is a triangular sail.



Not drawn accurately

1 (a) Vicky needs to buy waterproofing liquid for the sail.

She will put **3 coats** of liquid on **each** side of the sail.

A litre of liquid covers 8.5 square metres of sail.

How many 1-litre bottles of liquid does Vicky need?

[3 marks]

Area : $\frac{1}{2} \times 9.7 \times 3.8 \times \sin 73^\circ = 17.6\ldots m^2$ (1)

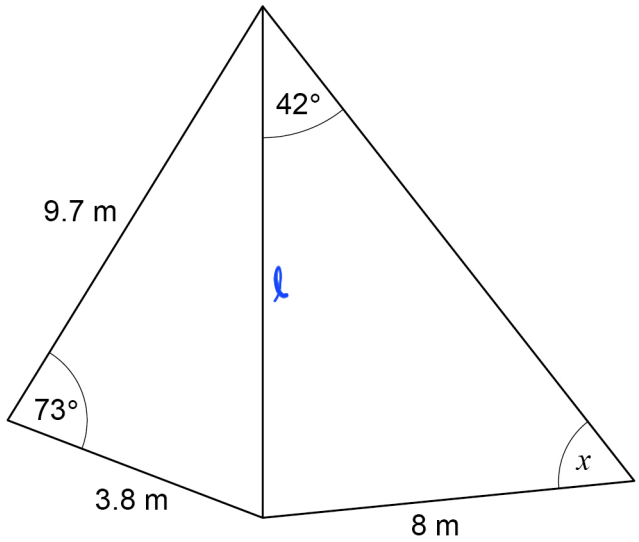
Total area of liquid needed : $17.6\ldots \times 6 = 105.7\ldots m^2$ (1)

$105.7 \div 8.5 = 12.4$

≈ 13 (1)

Answer 13

1 (b) Another sail is joined to the first sail as shown.



Not drawn accurately

x is an acute angle.

Work out the size of angle x.

[5 marks]

$l^2 = 9.7^2 + 3.8^2 - 2 \times 9.7 \times 3.8 \times \cos 73°$

$= 94.09 + 14.44 - 73.72 \cos 73°$

$= 86.976\ldots$ (1)

$l = \sqrt{86.976\ldots}$ (1)

$= 9.32\ldots$ (1)

$\frac{\sin x}{9.32\ldots} = \frac{\sin 42}{8}$ (1)

$\sin x = 0.0836\ldots \times 9.32\ldots$

$= 0.779\ldots$

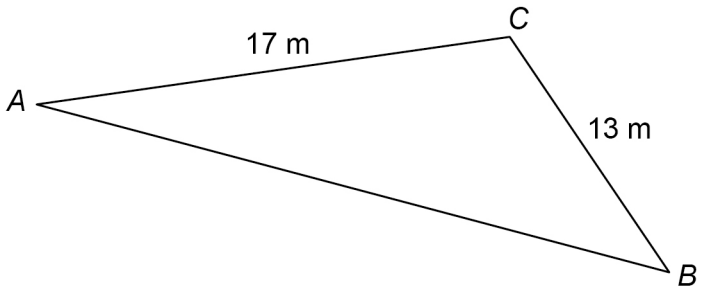
$x = \sin^{-1} 0.779\ldots$

$= 51.2°$

Answer 51.2 (1) degrees

2 (a) Here is a triangle.

Not drawn accurately



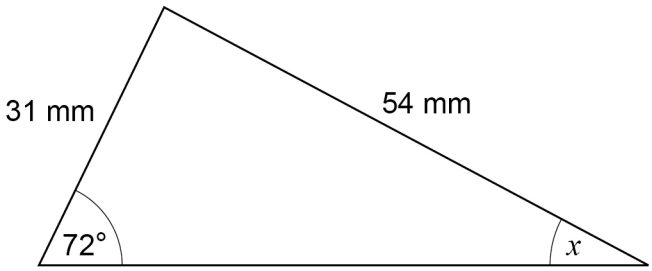
Give a reason why the length of side *AB* **cannot** be 35 m

[1 mark]

AB cannot be more than AC + BC. (1)

2 (b) Here is a different triangle.

Not drawn accurately



Leah tries to use the sine rule to work out the size of angle x.

Here are the first two lines of her working.

$$\frac{x}{\sin 31} = \frac{54}{\sin 72}$$

$$x = \frac{54 \sin 31}{\sin 72}$$

What error has she made in this working?

[1 mark]

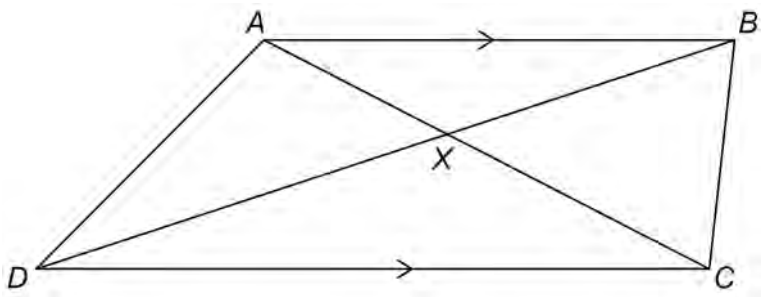
it should be $\frac{31}{\sin x}$ instead. (1)

3 *ABCD* is a trapezium.

All four sides are different lengths.

AB is parallel to *CD*.

The diagonals intersect at *X*.



Not drawn accurately

For each statement, tick the correct box.

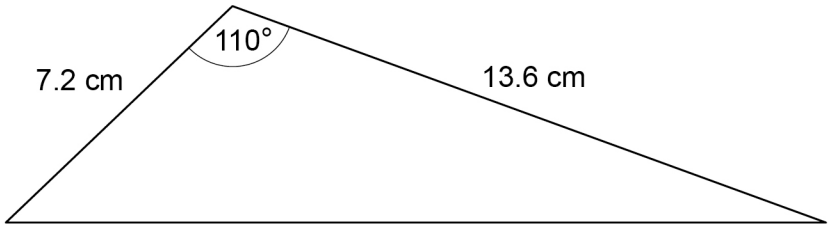
[4 marks]

	True	May be true	Not true
Triangles *AXB* and *CXD* are similar	✓ (1)		
Triangles *AXD* and *BXC* are congruent			✓ (1)
Angle *ADB* = angle *BDC*			✓ (1)
Area of triangle *ABC* = area of triangle *ABD*	✓ (1)		

4 Two sides of a triangle are measured to 1 decimal place.

The angle between the sides is measured to the nearest degree.

Not drawn accurately



Work out the upper bound for the area of the triangle.

You **must** show your working.

[4 marks]

UB : 7.25 , 110.5 , 13.65 (1)

LB : 7.15 , 109.5 , 13.55

(1)

$\text{Area}_{UB} = \frac{1}{2} \times 7.25 \times 13.65 \times \sin 109.5$ (1)

$= 46.64...$ (1)

Answer 46.64 cm^2