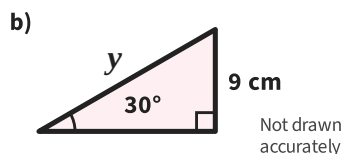
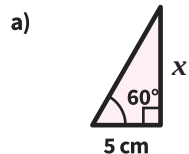


1 Exact trig values

Without a calculator, find the exact lengths x and y .



$$a) x = 5 \tan 60^\circ = 5\sqrt{3} \text{ cm}$$

$$b) y = 9 \div \sin 30^\circ = 9 \div \frac{1}{2} = 18 \text{ cm}$$

2 Exact trig values

Do not use a calculator.

a) Work out the exact value of $\sin 60^\circ \div \cos 60^\circ$. Which trig value is it equal to?

b) Solve $2 \cos \theta = \sqrt{3}$ for θ between 0° and 90° .

$$a) \frac{\sqrt{3}}{2} \div \frac{1}{2} = \sqrt{3}, \text{ the same as } \tan 60^\circ$$

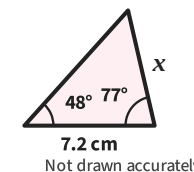
$$b) \cos \theta = \frac{\sqrt{3}}{2}, \theta = 30^\circ$$

3 Sine rule: finding a side

Give each answer to 1 decimal place.

a) Find x .

b) Coastguards A and B are 5 km apart on a straight coast. A boat is at X. Angle XAB = 62° and angle XBA = 49° . Find AX.



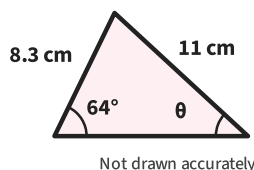
$$a) \text{ third angle } 55^\circ, x = \frac{7.2 \sin 48^\circ}{\sin 55^\circ} = 6.5 \text{ cm}$$

$$b) \text{ angle at the boat } 69^\circ, \frac{5 \sin 49^\circ}{\sin 69^\circ} = 4.0 \text{ km}$$

4 Sine rule: finding an angle

a) Find the angle θ to 1 decimal place.

b) Explain why θ cannot be an obtuse angle.



$$a) \sin \theta = \frac{8.3 \sin 64^\circ}{11}, \theta = 42.7^\circ$$

b) 8.3 cm is shorter than 11 cm, so θ is smaller than 64°

Pythagoras' theorem and trigonometry 2

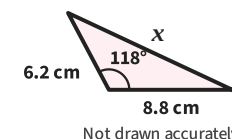
revision mat answers

5 The cosine rule

Give each answer to 1 decimal place.

a) Find x .

b) A parallelogram has sides of 5 cm and 9 cm and an angle of 65° . Find its longer diagonal.



$$a) x^2 = 6.2^2 + 8.8^2 - 2 \times 6.2 \times 8.8 \cos 118^\circ$$

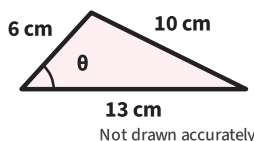
$$x = 12.9 \text{ cm}$$

$$b) \sqrt{5^2 + 9^2 - 90 \cos 115^\circ} = 12.0 \text{ cm}$$

6 The cosine rule

a) Find the angle θ to 1 decimal place.

b) A triangle has sides of 5 cm, 7 cm and 8 cm. Show that one of its angles is exactly 60° .



$$a) \cos \theta = \frac{6^2 + 13^2 - 10^2}{2 \times 6 \times 13} = \frac{105}{156}, \theta = 47.7^\circ$$

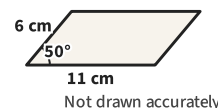
$$b) \text{ opposite } 7: \cos = \frac{25 + 64 - 49}{80} = \frac{1}{2}, \text{ so } 60^\circ$$

7 Area of a triangle: $\frac{1}{2}ab \sin C$

Give each answer to 1 decimal place.

a) Find the area of this parallelogram.

b) Two sides of a triangle meet at 72° . One is 8.2 cm long and the area is 35 cm^2 . Find the other.



$$a) 2 \times \frac{1}{2} \times 6 \times 11 \times \sin 50^\circ = 50.6 \text{ cm}^2$$

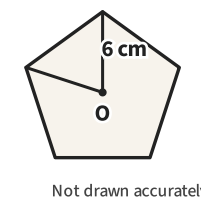
$$b) \frac{1}{2} \times 8.2 \times b \times \sin 72^\circ = 35, b = 9.0 \text{ cm}$$

8 Area of a triangle: $\frac{1}{2}ab \sin C$

Give each answer to 1 decimal place.

a) The regular pentagon has centre O. Each vertex is 6 cm from O. Find its area.

b) Find the area of a triangle with sides of 7 cm, 9 cm and 12 cm.



$$a) 5 \times \frac{1}{2} \times 6 \times 6 \times \sin 72^\circ = 85.6 \text{ cm}^2$$

$$b) \cos C = \frac{49 + 81 - 144}{126}, C = 96.38^\circ$$

$$\frac{1}{2} \times 7 \times 9 \times \sin 96.38^\circ = 31.3 \text{ cm}^2$$