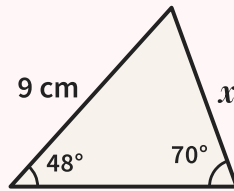


1 Find it and use it *Higher*

Have your formulae sheet in front of you. Find the formula you need, copy it from the sheet, then use it.

I do

Find the length x .
Give your answer to 1 decimal place.



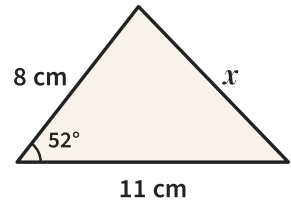
From your sheet $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Substitute $\frac{x}{\sin 48^\circ} = \frac{9}{\sin 70^\circ}$

Answer 7.1 cm

We do

Find the length x .
Give your answer to 1 decimal place.



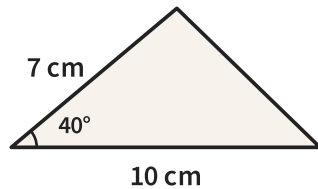
From your sheet $a^2 = b^2 + c^2 - 2bc \cos A$

Substitute $x^2 = 8^2 + 11^2 - 2 \times 8 \times 11 \times \cos 52^\circ$

Answer 8.8 cm

1

Find the area of the triangle.
Give your answer to 1 decimal place.



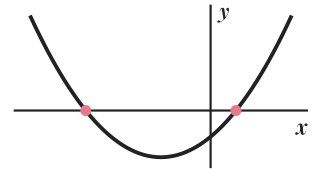
From your sheet $\text{Area} = \frac{1}{2} ab \sin C$

Substitute $\frac{1}{2} \times 7 \times 10 \times \sin 40^\circ$

Answer 22.5 cm²

2

Solve $2x^2 + 5x - 4 = 0$.
Give your answers to 2 decimal places.



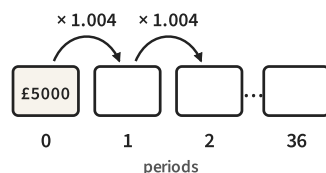
From your sheet $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Substitute $x = \frac{-5 \pm \sqrt{5^2 - 4 \times 2 \times (-4)}}{2 \times 2}$

Answer 0.64 or -3.14

3

£5000 is invested at 0.4% compound interest per month. Find the total after 3 years.



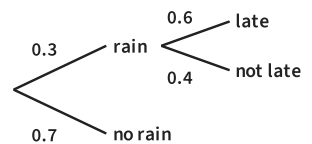
From your sheet $\text{Total} = P \left(1 + \frac{r}{100} \right)^n$

$n = 36 \text{ months}, 5000 \times 1.004^{36}$

Answer £5772.76

4

$P(\text{rain}) = 0.3$. When it rains, the probability the bus is late is 0.6. Find $P(\text{late and rain})$.



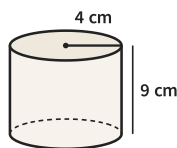
From your sheet $P(A \text{ and } B) = P(A \text{ given } B) P(B)$

0.6×0.3

Answer 0.18

5

Find the volume of the cylinder.
Give your answer to 1 decimal place.



From your sheet $\text{Area} = \pi r^2$, then $\times \text{length}$

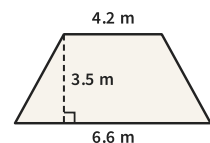
$\text{area of cross section} = \pi \times 4^2 = 50.27 \text{ cm}^2$

$\text{volume} = 50.27 \times 9$

Answer 452.4 cm³

6

One bag of bark covers 3 m². How many bags are needed to cover this flower bed?



From your sheet $\text{Area} = \frac{1}{2} (a + b)h$

$\text{area} = \frac{1}{2} (4.2 + 6.6) \times 3.5 = 18.90 \text{ m}^2$

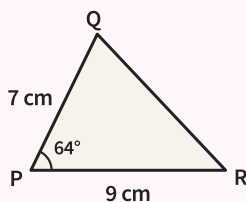
$18.90 \div 3 = 6.3$, so round up

Answer 7 bags

Find the formula on your formulae sheet. Match its letters to the lengths, angles and amounts in the question.

I do

Find QR to 1 decimal place.
Use the letters from your sheet.



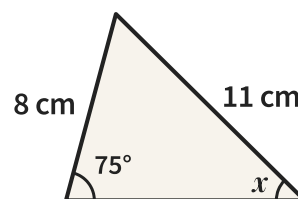
$$a = \underline{QR} \quad b = \underline{7} \quad c = \underline{9} \quad A = \underline{64^\circ}$$

From your sheet $a^2 = b^2 + c^2 - 2bc \cos A$

Answer $\underline{8.6 \text{ cm}}$

We do

Find angle x to 1 decimal place.



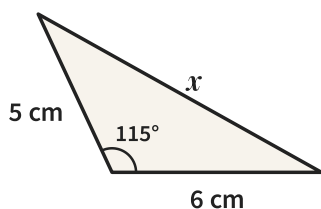
$$a = \underline{11} \quad A = \underline{75^\circ} \quad b = \underline{8} \quad B = \underline{x}$$

From your sheet $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Answer $\underline{44.6^\circ}$

1

Find x to 1 decimal place.



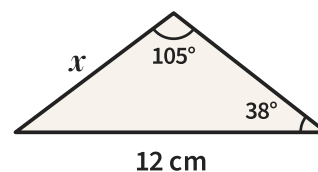
$$a = \underline{x} \quad b = \underline{5} \quad c = \underline{6} \quad A = \underline{115^\circ}$$

From your sheet $a^2 = b^2 + c^2 - 2bc \cos A$

Answer $\underline{9.3 \text{ cm}}$

2

Find x to 1 decimal place.



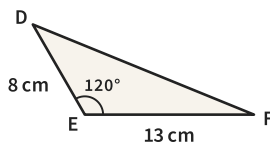
$$a = \underline{x} \quad A = \underline{38^\circ} \quad b = \underline{12} \quad B = \underline{105^\circ}$$

From your sheet $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Answer $\underline{7.6 \text{ cm}}$

3

Find the area of triangle DEF to 1 decimal place.
Which angle is C ?



From your sheet $\text{Area} = \frac{1}{2}ab \sin C$

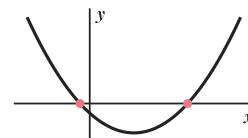
$$a = \underline{8} \quad b = \underline{13} \quad C = \underline{120^\circ, \text{ angle E}}$$

$$\frac{1}{2} \times 8 \times 13 \times \sin 120^\circ$$

Answer $\underline{45.0 \text{ cm}^2}$

4

Solve $3x^2 = 7x + 2$.
Give your answers to 2 decimal places.



From your sheet $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

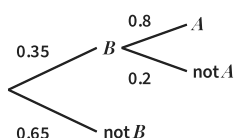
$$a = \underline{3} \quad b = \underline{-7} \quad c = \underline{-2}$$

$$3x^2 - 7x - 2 = 0, x = \frac{7 \pm \sqrt{73}}{6}$$

Answer $\underline{2.59 \text{ or } -0.26}$

5

Use the tree diagram to find $P(A \text{ and } B)$.



From your sheet $P(A \text{ and } B) = P(A \text{ given } B) P(B)$

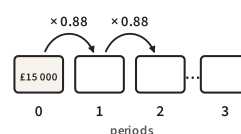
$$P(A \text{ given } B) = \underline{0.8} \quad P(B) = \underline{0.35}$$

$$\underline{0.8 \times 0.35}$$

Answer $\underline{0.28}$

6

A car worth £15 000 loses 12% of its value each year. Use the formula on your sheet to find its value after 3 years.



From your sheet $\text{Total} = P \left(1 + \frac{r}{100} \right)^n$

$$P = \underline{15000} \quad r = \underline{-12} \quad n = \underline{3}$$

$$\underline{15000 \times 0.88^3}$$

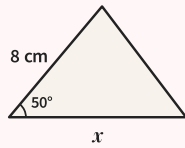
Answer $\underline{£10222.08}$

3 Turn it round *Higher*

Find the formula on your formulae sheet, substitute what you know, then rearrange to find the letter you need.

I do

The area of the triangle is 30 cm^2 . Find x to 1 decimal place.



From your sheet $\text{Area} = \frac{1}{2}ab \sin C$

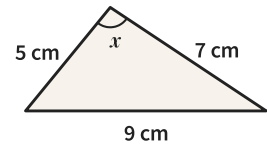
Substitute $30 = \frac{1}{2} \times 8 \times x \times \sin 50^\circ$

Rearrange $x = \frac{30}{4 \sin 50^\circ}$

Answer 9.8 cm

We do

Find angle x to 1 decimal place.



From your sheet $a^2 = b^2 + c^2 - 2bc \cos A$

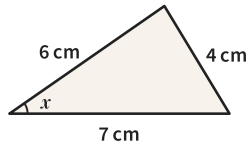
Substitute $9^2 = 5^2 + 7^2 - 2 \times 5 \times 7 \times \cos x$

Rearrange $\cos x = \frac{5^2 + 7^2 - 9^2}{2 \times 5 \times 7}$

Answer 95.7°

1

Find angle x to 1 decimal place.



From your sheet $a^2 = b^2 + c^2 - 2bc \cos A$

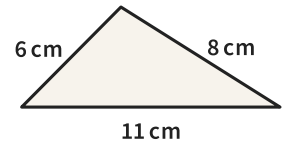
Substitute $4^2 = 6^2 + 7^2 - 2 \times 6 \times 7 \times \cos x$

Rearrange $\cos x = \frac{6^2 + 7^2 - 4^2}{2 \times 6 \times 7}$

Answer 34.8°

2

Find the largest angle in the triangle to 1 decimal place.



From your sheet $a^2 = b^2 + c^2 - 2bc \cos A$

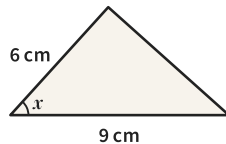
Substitute $11^2 = 6^2 + 8^2 - 2 \times 6 \times 8 \times \cos x$

Rearrange $\cos x = \frac{6^2 + 8^2 - 11^2}{2 \times 6 \times 8}$

Answer 102.6°

3

The area of the triangle is 20 cm^2 . Angle x is acute. Find x to 1 decimal place.



From your sheet $\text{Area} = \frac{1}{2}ab \sin C$

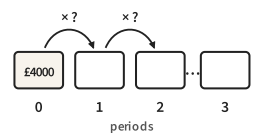
$20 = \frac{1}{2} \times 6 \times 9 \times \sin x$

$\sin x = \frac{40}{54}$

Answer 47.8°

4

£4000 grows to £4500 in 3 years at a fixed rate of compound interest per year. Find the rate to 1 decimal place.



From your sheet $\text{Total} = P \left(1 + \frac{r}{100} \right)^n$

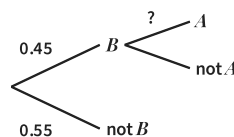
$4500 = 4000 \left(1 + \frac{r}{100} \right)^3$

$1 + \frac{r}{100} = \sqrt[3]{1.125}$

Answer 4.0%

5

$P(A \text{ and } B) = 0.18$ and $P(B) = 0.45$. Find $P(A \text{ given } B)$.



From your sheet $P(A \text{ and } B) = P(A \text{ given } B) P(B)$

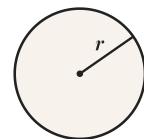
$0.18 = P(A \text{ given } B) \times 0.45$

$0.18 \div 0.45$

Answer 0.4

6

A circle has an area of 200 cm^2 . Find its circumference to 1 decimal place.



From your sheet $\text{Area} = \pi r^2$, then $2\pi r$

$200 = \pi r^2$, $r = 7.979$

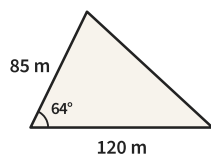
$2 \times \pi \times 7.979$

Answer 50.1 cm

Use your formulae sheet for every question. Some questions need two formulae from it.

1

A field is a triangle. Find the length of fence needed to go all the way round it, to the nearest metre.



From your sheet $a^2 = b^2 + c^2 - 2bc \cos A$

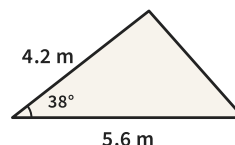
$$\text{third side}^2 = 85^2 + 120^2 - 2 \times 85 \times 120 \times \cos 64^\circ$$

$$\text{third side} = 112.6 \text{ m, add all three}$$

Answer 318 m

2

A sail is a triangle. Two of its edges are 4.2 m and 5.6 m with an angle of 38° between them. Find the area of the sail.



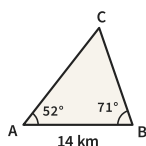
From your sheet $\text{Area} = \frac{1}{2} ab \sin C$

$$\frac{1}{2} \times 4.2 \times 5.6 \times \sin 38^\circ$$

Answer 7.24 m²

3

Find BC to 1 decimal place.



From your sheet $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

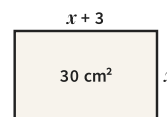
$$\text{angle } C = 180^\circ - 52^\circ - 71^\circ = 57^\circ$$

$$\frac{BC}{\sin 52^\circ} = \frac{14}{\sin 57^\circ}$$

Answer 13.2 km

4

The rectangle has an area of 30 cm^2 . Find x to 2 decimal places.



From your sheet $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

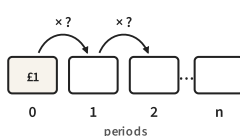
$$x^2 + 3x - 30 = 0$$

$$x = \frac{-3 \pm \sqrt{129}}{2}, x \text{ is a length so it is positive}$$

Answer 4.18 cm

5

Which account pays more over 5 years: 3.1% compound interest per year or 0.25% compound interest per month?



From your sheet $\text{Total} = P \left(1 + \frac{r}{100} \right)^n$

$$\text{year: } 1.031^5 = 1.1649$$

$$\text{month: } 1.0025^{60} = 1.1616$$

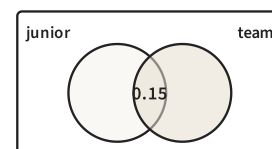
Answer 3.1% per year

6

$P(\text{junior and team}) = 0.15$

$P(\text{team}) = 0.24$

Find $P(\text{junior given team})$.



From your sheet $P(A \text{ and } B) = P(A \text{ given } B) P(B)$

$$0.15 = P(\text{junior given team}) \times 0.24$$

$$0.15 \div 0.24$$

Answer 0.625

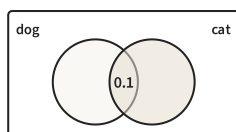
7

A student is picked at random.

$P(\text{has a dog}) = 0.35$, $P(\text{has a cat}) = 0.3$

and $P(\text{has a dog and a cat}) = 0.1$.

Find $P(\text{has a dog or a cat})$.



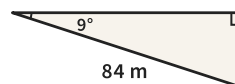
From your sheet $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$

$$0.35 + 0.3 - 0.1$$

Answer 0.55

8

A zip wire is 84 m long and slopes at 9° to the horizontal. Find its vertical drop to 1 decimal place.



From your sheet $\sin A = \frac{a}{c}$

$$\sin 9^\circ = \frac{\text{drop}}{84}$$

$$\text{drop} = 84 \times \sin 9^\circ$$

Answer 13.1 m