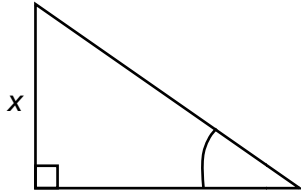


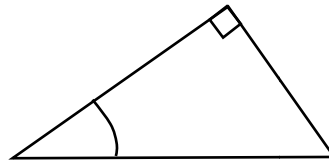
Foundation Check In - 10.05b & 10.05c Trigonometry in right-angled triangles

Calculate the value of x in each of these right-angled triangles.

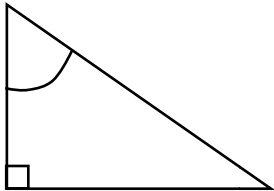
1.



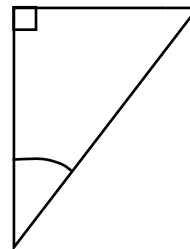
2.



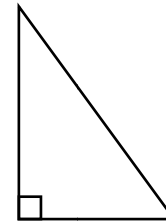
3.



4.

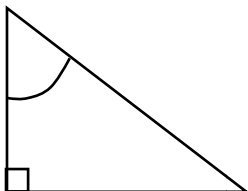


5. The diagram opposite shows a ladder of length 2.4 m leaning against a vertical wall. Calculate the angle the ladder makes with the horizontal.



Do not use a calculator in questions 6, 7 and 8.

6. Using the diagram below, show that $\cos 60^\circ$ is the same as $\sin 30^\circ$.

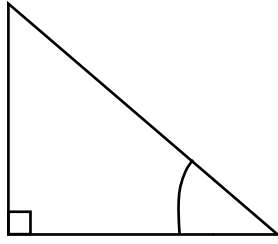


7. Using the diagram in question 6, show that $\tan 60^\circ$ is equal to $\sqrt{3}$.

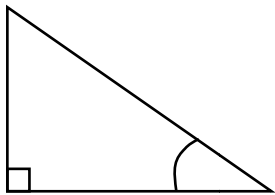


GCSE (9-1) MATHEMATICS

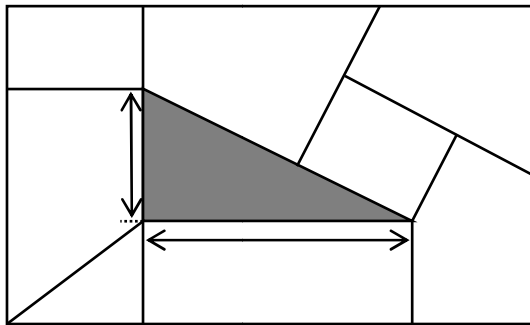
8. Using the diagram below, explain why $\tan 45^\circ$ is equal to 1.



9. Here is a triangular piece of jigsaw.



Will it fit in the shaded part of the puzzle below? Show how you decide.



10. A ship sails 20 km west, and then changes direction and sails 30 km south. What bearing will the ship need to take in order to then sail back to the start position?

Extension

Copy and complete the results table for sine values from 0° to 360° going up in 15° intervals.

Angle x°	0	15	30	45					...
$\sin x^\circ$	0	0.259	0.5	0.707					...

Repeat for cos and tan and comment on your results.



GCSE (9-1) MATHEMATICS

Answer

1. 15.0 cm
2. 7.0 cm
3. 32.4 cm
4. 36.9°
5. 70.5°
6. The missing angle in the triangle is 30° because $180 - 90 - 60 = 30$.

$$\cos 60^\circ = \frac{a}{h} = \frac{1}{2} \quad \text{and} \quad \sin 30^\circ = \frac{o}{h} = \frac{1}{2}.$$

7. The missing side in the triangle is $\sqrt{2^2 - 1^2} = \sqrt{3}$.

$$\tan 60^\circ = \frac{o}{a} = \frac{\sqrt{3}}{1} = \sqrt{3}.$$

8. The missing angle in the triangle is 45° because $180 - 90 - 45 = 45$, which means it is an isosceles triangle. Therefore, the opposite and adjacent sides are the same length so $\tan 45^\circ = \frac{o}{a} = 1$ oe.

9. $\tan 40 = \frac{x}{10}$

$$x = 10 \tan 40 = 8.4 \text{ cm so no it won't fit.}$$

10. $\tan^{-1}\left(\frac{30}{20}\right) = 56.3$

Bearing is 056°.



GCSE (9-1) MATHEMATICS

Extension

Angle x°	0	15	30	45	60	75	90	105	120
$\sin x^\circ$	0	0.259	0.5	0.707	0.866	0.966	1	0.966	0.866
$\cos x^\circ$	1	0.966	0.866	0.707	0.5	0.259	0	-0.259	-0.5
$\tan x^\circ$	0	0.268	0.577	1	1.732	3.732	∞	-3.732	-1.732

Angle x°	135	150	165	180	195	210	225	240	255
$\sin x^\circ$	0.707	0.5	0.259	0	-0.259	-0.5	-0.707	-0.866	-0.966
$\cos x^\circ$	-0.707	-0.866	-0.966	-1	-0.966	-0.866	-0.707	-0.5	-0.259
$\tan x^\circ$	-1	-0.577	-0.268	0	0.268	0.577	1	1.732	3.732

Angle x°	270	285	300	315	330	345	360
$\sin x^\circ$	-1	-0.966	-0.866	-0.707	-0.5	-0.259	0
$\cos x^\circ$	0	0.259	0.5	0.707	0.866	0.966	1
$\tan x^\circ$	∞	-3.732	-1.732	-1	-0.577	-0.268	0

We'd like to know your view on the resources we produce. By clicking on '[Like](#)' or '[Dislike](#)' you can help us to ensure that our resources work for you. When the email template pops up please add additional comments if you wish and then just click 'Send'. Thank you.

If you do not currently offer this OCR qualification but would like to do so, please complete the Expression of Interest Form which can be found here: www.ocr.org.uk/expression-of-interest

OCR Resources: *the small print*

OCR's resources are provided to support the teaching of OCR specifications, but in no way constitute an endorsed teaching method that is required by the Board, and the decision to use them lies with the individual teacher. Whilst every effort is made to ensure the accuracy of the content, OCR cannot be held responsible for any errors or omissions within these resources.

© OCR 2015 - This resource may be freely copied and distributed, as long as the OCR logo and this message remain intact and OCR is acknowledged as the originator of this work.

OCR acknowledges the use of the following content: n/a

Please get in touch if you want to discuss the accessibility of resources we offer to support delivery of our qualifications: resources.feedback@ocr.org.uk



Assessment Objective	Qu.	Topic	R	A	G
AO1	1	Find side length using right-angled trigonometry			
AO1	2	Find side length using right-angled trigonometry			
AO1	3	Find side length using right-angled trigonometry			
AO1	4	Find angle using right-angled trigonometry			
AO1	5	Find angle using right-angled trigonometry			
AO2	6	Use knowledge of exact values of trigonometry ratios			
AO2	7	Use knowledge of exact values of trigonometry ratios			
AO2	8	Use knowledge of exact values of trigonometry ratios			
AO3	9	Apply trigonometry to solve a problem			
AO3	10	Apply trigonometry to solve a problem			

Assessment Objective	Qu.	Topic	R	A	G
AO1	1	Find side length using right-angled trigonometry			
AO1	2	Find side length using right-angled trigonometry			
AO1	3	Find side length using right-angled trigonometry			
AO1	4	Find angle using right-angled trigonometry			
AO1	5	Find angle using right-angled trigonometry			
AO2	6	Use knowledge of exact values of trigonometry ratios			
AO2	7	Use knowledge of exact values of trigonometry ratios			
AO2	8	Use knowledge of exact values of trigonometry ratios			
AO3	9	Apply trigonometry to solve a problem			
AO3	10	Apply trigonometry to solve a problem			

Assessment Objective	Qu.	Topic	R	A	G
AO1	1	Find side length using right-angled trigonometry			
AO1	2	Find side length using right-angled trigonometry			
AO1	3	Find side length using right-angled trigonometry			
AO1	4	Find angle using right-angled trigonometry			
AO1	5	Find angle using right-angled trigonometry			
AO2	6	Use knowledge of exact values of trigonometry ratios			
AO2	7	Use knowledge of exact values of trigonometry ratios			
AO2	8	Use knowledge of exact values of trigonometry ratios			
AO3	9	Apply trigonometry to solve a problem			
AO3	10	Apply trigonometry to solve a problem			

Assessment Objective	Qu.	Topic	R	A	G
AO1	1	Find side length using right-angled trigonometry			
AO1	2	Find side length using right-angled trigonometry			
AO1	3	Find side length using right-angled trigonometry			
AO1	4	Find angle using right-angled trigonometry			
AO1	5	Find angle using right-angled trigonometry			
AO2	6	Use knowledge of exact values of trigonometry ratios			
AO2	7	Use knowledge of exact values of trigonometry ratios			
AO2	8	Use knowledge of exact values of trigonometry ratios			
AO3	9	Apply trigonometry to solve a problem			
AO3	10	Apply trigonometry to solve a problem			

