

Spring Progress Check Revision Material

Year 10 Set 4 - 7

Foundation 1

Test Date: Wednesday 24 Jan

How to revise for Maths?

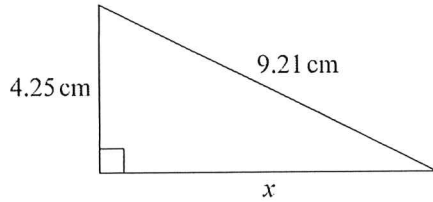
- *Practise is key! Attached you will find some questions to help you do that.*
- *Once you've answered the questions – mark your work.*
- *If you get something wrong, look back on what you did and try work out where your mistake is. Unsure? Take your answers to your teacher or to Maths club on a Thursday and get help ahead of the test!*
- *Good luck!*

NAME

1 The diagram shows a right-angled triangle.

a Calculate the value of x .

Give your answer correct to 3 significant figures.



(3 marks)

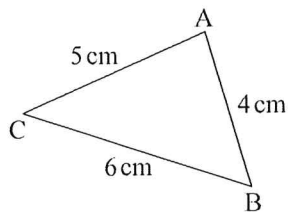
b Calculate the area of the triangle.

Give your answer to 3 significant figures.

(3 marks)

2 Is triangle ABC a right-angled triangle?

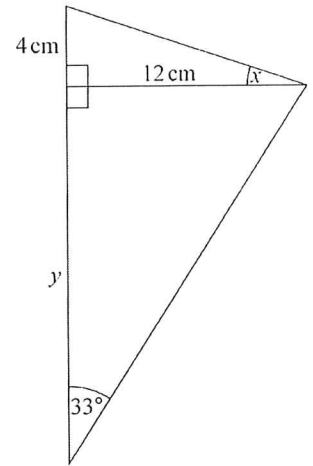
Explain your answer.



(2 marks)



- 3 Use the tangent ratio to find:
- a the size of the angle labelled x



(1 mark)

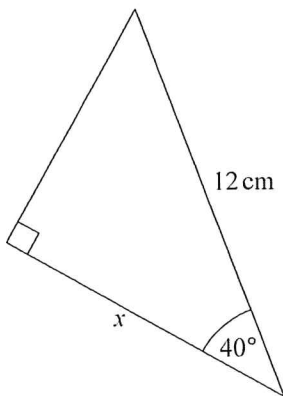
- b the length labelled y .

(2 marks)

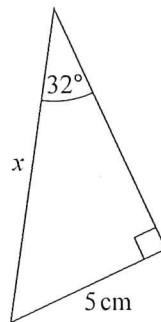


- 4 Calculate the value of x in each triangle.

a



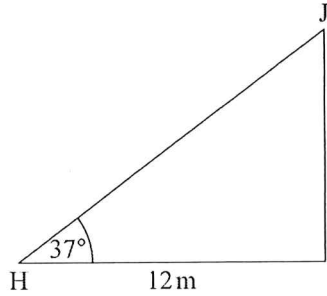
b



(6 marks)



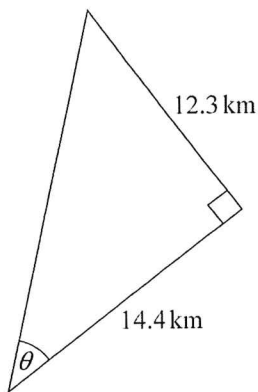
- 5 James is sitting on top of a vertical wall, holding one end of a piece of rope. Harrinda is 12 m from the base of the wall, holding the other end. The rope makes an angle of 37° to the horizontal. Work out the length of the rope.



(3 marks)



- 6 Calculate the size of angle θ in this triangle.



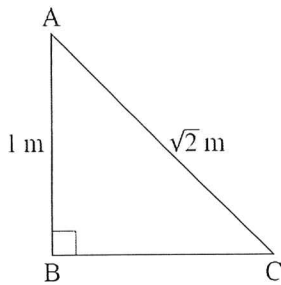
(3 marks)



- 7 A bird is sitting on top of a 10 m telegraph pole.
A bird-watcher spots it; the angle of elevation to the bird is 63° .
Calculate the horizontal distance between the bird-watcher and the telegraph pole.
Give your answer correct to 1 decimal place.

(4 marks)

- 8 The diagram shows triangle ABC.



- a Use trigonometry to work out the exact value of angle ACB.

(2 marks)

- b Use Pythagoras' theorem to work out the length of side BC.

(2 marks)

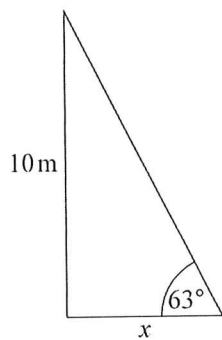
- c What kind of triangle is ABC? Explain your answer.

(1 mark)

| | |
|--------------|-----|
| Overall mark | /32 |
|--------------|-----|

| Q | Answer | Mark | Comment |
|-----------|---------------------------------------|------|---------------|
| 1a | $x^2 = 9.21^2 - 4.25^2$ | M1 | or equivalent |
| | $x = 8.170\dots$ cm | A1 | |
| | $x = 8.17$ cm | A1 | |
| 1b | $\frac{1}{2} \times 8.17 \times 4.25$ | M1 | |
| | $= 17.361\dots$ | M1 | |
| | $= 17.4 \text{ cm}^2$ | A1 | |
| 2 | No | A1 | |
| | since $6^2 \neq 4^2 + 5^2$ | M1 | or equivalent |
| 3a | $\tan x = \frac{4}{12}$ | | |
| | $x = 18.4^\circ$ | A1 | |
| 3b | $\tan 33^\circ = \frac{12}{y}$ | | |
| | $y = \frac{12}{\tan 33^\circ}$ | M1 | |
| | $y = 18.48$ cm | A1 | |
| 4a | $\cos 40^\circ = \frac{x}{12}$ | M1 | |
| | $x = 12 \cos 40^\circ$ | M1 | |
| | $x = 9.19$ cm | A1 | |
| 4b | $\sin 32^\circ = \frac{5}{x}$ | M1 | |
| | $x = \frac{5}{\sin 32^\circ}$ | M1 | |
| | $x = 9.44$ cm | A1 | |

| Q | Answer | Mark | Comment |
|---|---|------|-------------|
| 5 | $\cos 37^\circ = \frac{12}{x}$ | M1 | |
| | $x = \frac{12}{\cos 37^\circ}$ | M1 | |
| | $x = 15(.03)\text{m}$ | A1 | |
| 6 | $\tan \theta = \frac{12.3}{14.4}$ | M1 | |
| | $\theta = \tan^{-1} \left(\frac{12.3}{14.4} \right)$ | M1 | |
| | $\theta = 40.5^\circ$ | A1 | |
| 7 | See the diagram | M1 | For diagram |



| | | | |
|--|--------------------------------|----|--|
| | $\tan 63^\circ = \frac{10}{x}$ | M1 | For calculation, allow both marks if only the calculation is seen. |
| | $x = \frac{10}{\tan 63^\circ}$ | M1 | |
| | $x = 5.10\text{m}$ | A1 | |

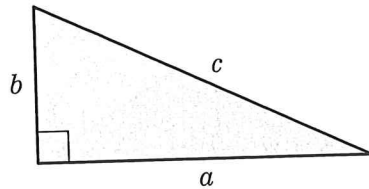
| Q | Answer | Mark | Comment |
|----|---|------|-----------------------------------|
| 8a | $\sin x = \frac{1}{\sqrt{2}}$ | M1 | |
| | $x (= \text{angle ACB}) = 45^\circ$ | A1 | |
| 8b | $BC^2 = 2 - 1^2$ | M1 | |
| | $BC = 1 \text{ m}$ | A1 | |
| 8c | It is an isosceles triangle since $BC = AB$ OR angle ACB = angle BAC | A1 | Allow the mark for either answer. |

Progression Step Boundaries

| Mark boundary | Step |
|---------------|-----------------|
| 0 | U |
| 1 | 5 th |
| 4 | 6 th |
| 9 | 7 th |
| 17 | 8 th |

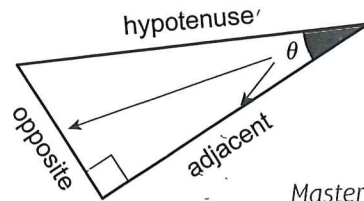
12 Knowledge check

- ⊙ In a right-angled triangle the **hypotenuse** is the longest side and is opposite the right angle. Mastery lesson 12.1
- ⊙ Pythagoras' theorem shows the relationship between the lengths of the three sides of a right-angled triangle.



- $c^2 = a^2 + b^2$ Mastery lesson 12.1
- ⊙ A triangle with sides a , b and c , where c is the longest side, is right-angled only if $c^2 = a^2 + b^2$ Mastery lesson 12.2

- ⊙ In a right-angled triangle, the side opposite the angle θ is called the **opposite**. The side next to the angle θ is called the **adjacent**.



- Mastery lesson 12.3
- ⊙ The **sine** of an angle is the ratio of the opposite side to the hypotenuse. The sine of angle θ is written as $\sin \theta$.

..... $\sin \theta = \frac{\text{opp}}{\text{hyp}}$ Mastery lesson 12.3

- ⊙ The **cosine** of an angle is the ratio of the adjacent side to the hypotenuse. The cosine of angle θ is written as $\cos \theta$.

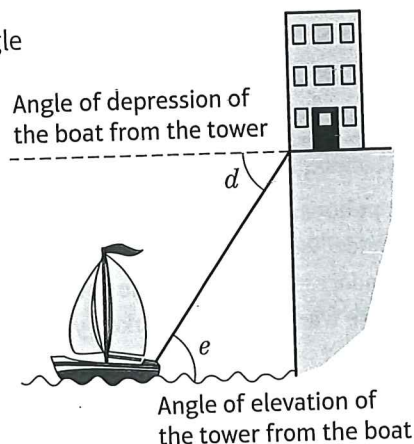
..... $\cos \theta = \frac{\text{adj}}{\text{hyp}}$ Mastery lesson 12.5

- ⊙ The **tangent** of an angle is the ratio of the opposite side to the adjacent side. The tangent of angle θ is written as $\tan \theta$.

..... $\tan \theta = \frac{\text{opp}}{\text{adj}}$ Mastery lesson 12.6

- ⊙ You can use \sin^{-1} , \cos^{-1} or \tan^{-1} to find the size of an angle. Mastery lesson 12.4, 12.5, 12.6

- ⊙ The **angle of elevation** is the angle measured upwards from the horizontal. The **angle of depression** is the angle measured downwards from the horizontal.



..... Mastery lesson 12.6

- ⊙ The sine, cosine and tangent of some angles may be written exactly.

| | 30° | 45° | 60° | 90° |
|-----|----------------------|----------------------|----------------------|-----|
| sin | $\frac{1}{2}$ | $\frac{1}{\sqrt{2}}$ | $\frac{\sqrt{3}}{2}$ | 1 |
| cos | $\frac{\sqrt{3}}{2}$ | $\frac{1}{\sqrt{2}}$ | $\frac{1}{2}$ | 0 |
| tan | $\frac{1}{\sqrt{3}}$ | 1 | $\sqrt{3}$ | |

Mastery lesson 12.7

Look back at this unit.

Which lesson did you like most? Write a sentence to explain why.

Which lesson did you like least? Write a sentence to explain why.

Begin your sentence with: I liked lesson ... most/least because ...