Name:

Exam Style Questions

Trigonometry

Corbettmaths

Ensure you have: Pencil, pen, ruler, protractor, pair of compasses and eraser

You may use tracing paper if needed

Guidance

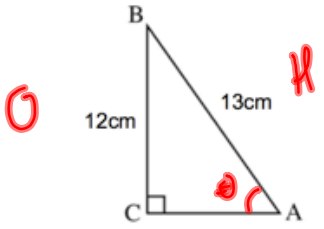
1. Read each question carefully before you begin answering it.
2. Don't spend too long on one question.
3. Attempt every question.
4. Check your answers seem right.
5. Always show your workings

Revision for this topic

www.corbettmaths.com/contents

Video 329
Video 330
Video 331

1.



Calculate the size of angle BAC.

$\sin\theta = \frac{O}{H}$

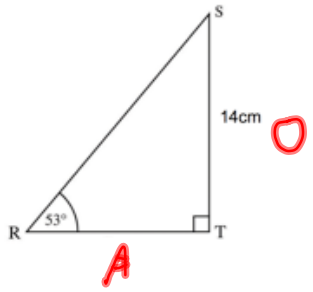
$\sin\theta = \frac{12}{13}$

$\sin^{-1}\frac{12}{13} =$

67.38 .....°

(3)

2.



Find the length of the side RT in the triangle above.

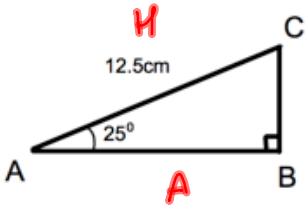
$RT = \frac{14}{\tan 53}$

$= 10.549..$

10.55 .....cm

(3)

3. Triangle ABC has a right angle.
Angle BAC is 25°
AC = 12.5cm



Not to scale

Calculate the length of AB

$AB = \cos(25) \times 12.5$

$= 11.328...$

11.33 .....cm

(3)

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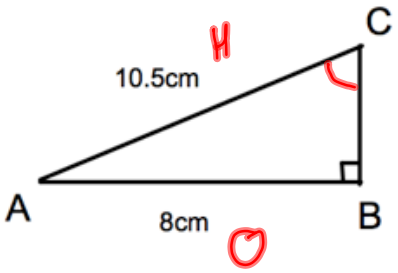
4. ABC is a right-angled triangle.



Calculate the size of angle ACB.

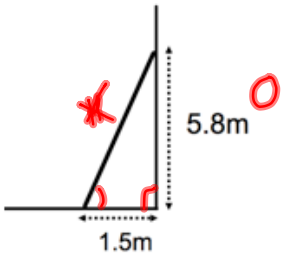
$\sin\theta = \frac{8}{10.5}$

$\sin^{-1}\frac{8}{10.5} =$

49.63 .....°

(3)

5. A ladder is placed against a wall.
To be safe, it must be inclined at between 70° and 80° to the ground.



(a) Is the ladder safe?

$\tan\theta = \frac{5.8}{1.5}$

$\tan^{-1}\frac{5.8}{1.5} = 75.49..$

yes, it is safe

.....

(3)

(b) Calculate the length of the ladder.

$a^2 + b^2 = c^2$

$1.5^2 + 5.8^2 = x^2$

$x^2 = 35.89$

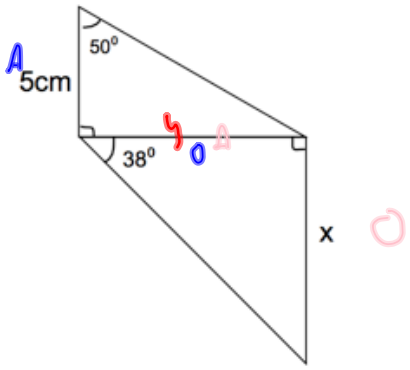
$x = 5.99$

5.99 m

.....

(3)

6. The diagram shows two right-angled triangles.



Calculate the value of x.

$y = \tan(50) \times 5 = 5.9587...$

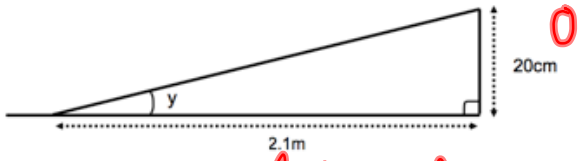
$x = \tan(38) \times 5.9587... = 4.655...$

4.655

.....cm

(5)

7. A ramp is 2.1m long and 20cm high.



O

210cm A

Calculate the size of angle y.

$\tan y = \frac{20}{210}$

$\tan^{-1}\left(\frac{20}{210}\right) =$ 5.44 .....°

(3)

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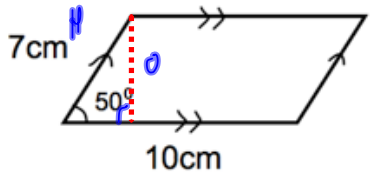
8. Shown below is a parallelogram.



Calculate the area of the parallelogram.

Opp = $\sin(50) \times 7$

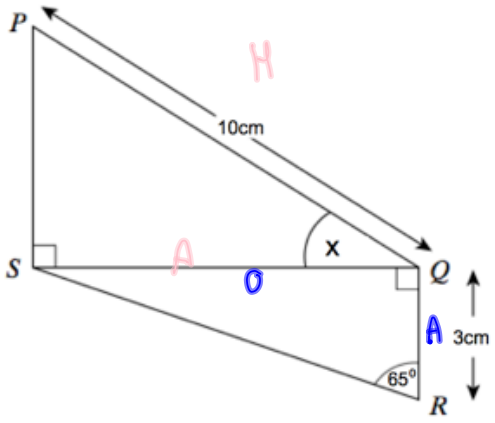
$= 5.362\ldots$

Area = $10 \times 5.3623\ldots$

53.62 .....cm²

(5)

9. Two right-angled triangles are shown below.
PQ is 10cm.
QR is 3cm.
Angle QRS is 65°



Calculate the size of angle PQS

$QS = \tan(65) \times 3$

$= 6.4335\ldots$

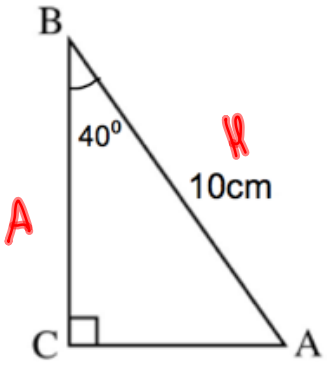
$\cos x = \frac{6.4335\ldots}{10}$

$\cos^{-1}\left(\frac{6.4335\ldots}{10}\right) =$

49.96 .....°

(5)

10. The diagram shows a right-angled triangle ABC. **(Non-calculator question)**



Angle	Sine	Cosine	Tangent
40°	0.643	0.766	0.839
50°	0.766	0.643	1.192

Calculate the length of BC.

$BC = \cos(40) \times 10$

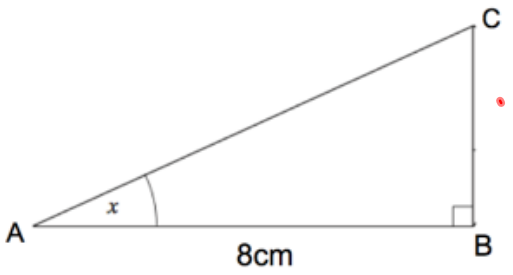
$= 0.766 \times 10$

$= 7.66$

7.66 .....cm

(3)

11. Below is a right-angled triangle. **(Non-calculator question)**
tan x = 0.6
AB is 8cm



Work out the length of BC

BC = tan x × 8

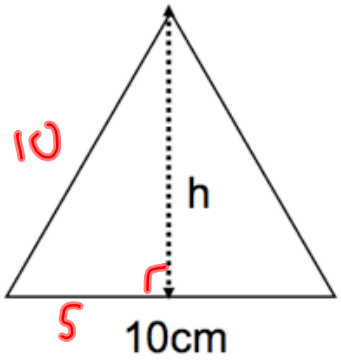
BC = 0.6 × 8 = 4.8

4.8

.....cm

(3)

12. Below is an equilateral triangle



(a) Calculate the height of the triangle.

$h^2 + 5^2 = 10^2$

$h^2 + 25 = 100$

$h^2 = 75$ $h = 5\sqrt{3}$ or 8.66025...

.....cm

(3)

(b) Calculate the area of the triangle.

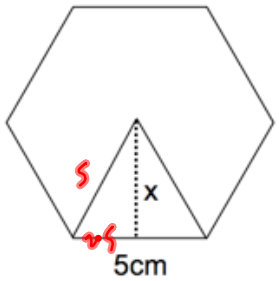
$\frac{1}{2} \times 10 \times 5\sqrt{3}$ or 8.66025...

$25\sqrt{3} = 43.3...$

43.3 .....cm²

(1)

13. A regular hexagon can be divided into 6 equilateral triangles.
The diagram below shows one of the equilateral triangles.



(a) Calculate the height, x, of the equilateral triangle above.

$5^2 = x^2 + 2.5^2$

$x^2 = 18.75$

$x = 4.33..$ or $\frac{5}{2}\sqrt{3}$

4.33... .....cm
(3)

(b) Calculate the area of the equilateral triangle.

$\frac{1}{2} \times 5 \times 4.33...$ or $\left(\frac{5}{2}\sqrt{3}\right)$

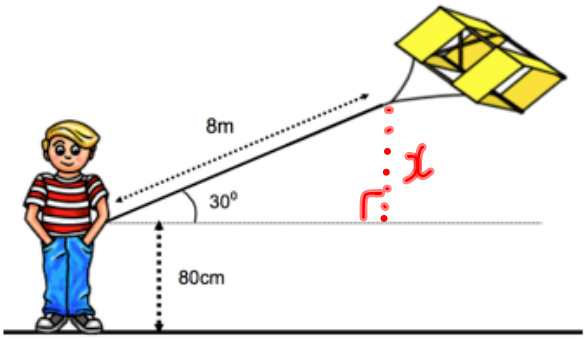
10.825 or $\frac{25}{4}\sqrt{3}$ .....cm²
(1)

(c) Calculate the area of the hexagon.

$10.825... \times 6 =$

64.95 or $\frac{75}{2}\sqrt{3}$ .....cm²
(1)

14. A boy is flying a kite.



The string is held 80cm above the ground.
The kite is on a string which is 8m long.
The string makes an angle of 30° with the horizontal.

Calculate the height of the kite above the ground.

$x = \sin(30) \times 8 = 4\text{m}$

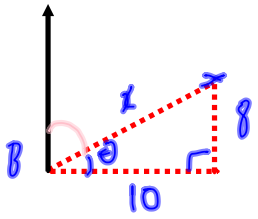
$4\text{m} + 80\text{cm}$

4.8 .....m

(4)

15. A helicopter leaves Bristol and flies due east for 10 miles.
Then the helicopter flies 8 miles north before landing.

(a) Work out the direct distance of the helicopter from Bristol.



$x^2 = 8^2 + 10^2$

$x^2 = 164$

$x =$

12.806 ..... miles

(3)

(b) Calculate the bearing of the helicopter from Bristol.

$\tan\theta = \frac{8}{10}$

$\tan^{-1}\left(\frac{8}{10}\right)$

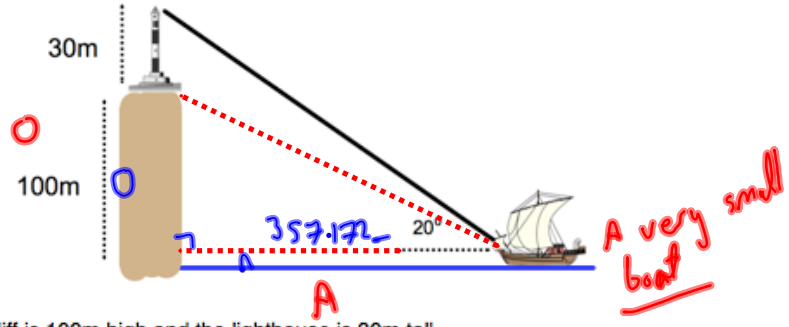
$\theta = 38.659...$

$90 - 38.659... = 51.34$

051.34 (051) .....°

(3)

16. A boat is approaching a cliff with a lighthouse on top.



The cliff is 100m high and the lighthouse is 30m tall.
The angle of elevation from the boat to the top of the lighthouse is 20°.

(a) Calculate the distance of the boat to the base of the cliff.

$\approx \frac{130}{\tan 20} = 357.172...$

≈ 357.17

.....m

(3)

(b) Work out the angle of elevation from the boat to the top of the cliff.

$\tan x = \frac{100}{357.172...}$

$\tan^{-1}\left(\frac{100}{357.172...}\right) =$

15.641

.....°

(3)