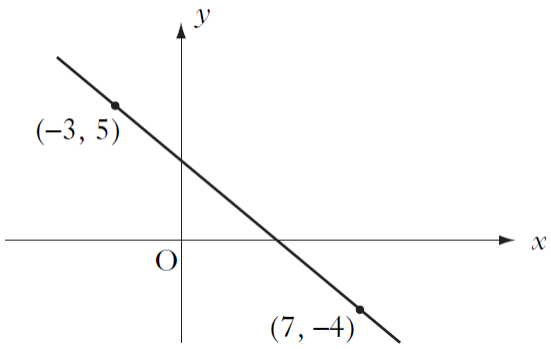
National 5 Revision C Paper 2 Based on Int 2 2011

1. Find the equation of the line shown below:



3

2. 4

It is estimated that house prices will increase at the rate of 3·15% per annum.

A house is valued at £134 750. If its value increases at the predicted rate, calculate its value after 3 years.

Give your answer correct to **four** significant figures.

3. Change the subject of the formula to *r*. $A = 4\pi r^2$

2

4. The Battle of Largs in 1263 is commemorated by a monument known as The Pencil.

This monument is in the shape of a cylinder with a cone on top.

The cylinder part has diameter 3 metres and height 15 metres.

(*a*) Calculate the volume of the **cylinder** part of The Pencil. 2

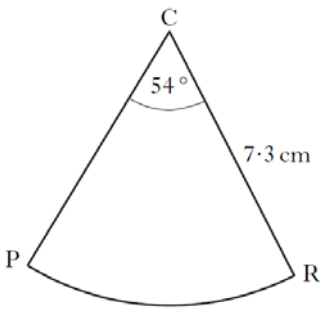
The volume of the **cone** part of The Pencil is 5·7 cubic metres.

(*b*) Calculate the **total** height of The Pencil. 3

5. The diagram shows the sector of a circle.

The radius of the circle is 7.3 cm and angle PCR is 54°.

Calculate the area of the sector PCR.



[3]

6. Simplify:

$$\frac{3x-15}{(x-5)^2}.$$

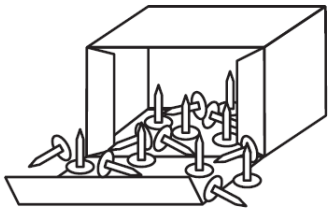
2

7. Express as a single fraction in its simplest form: $\frac{3}{x} - \frac{4}{x+1}, \qquad x \neq 0, \quad x \neq -1$ 3

8.

A sample of six boxes contains the following numbers of pins per box.

43 39 41 40 39 44



(*a*) For the above data, calculate:

(i) the mean;

(ii) the standard deviation.

The company which produces the pins claims that "the mean number of pins per box is 40 ± 2 and the standard deviation is less than 3".

(*b*) Does the data in part (*a*) support the claim made by the company?

Give reasons for your answer.

[1, 3, 2]

9. Alan is taking part in a quiz. He is awarded x points for each correct answer and y points for each wrong answer. During the quiz, Alan gets 24 questions correct and 6 wrong. He scores 60 points.

(*a*) Write down an equation in x and y which satisfies the above condition. **1**

Helen also takes part in the quiz. She gets 20 questions correct and 10 wrong. She scores 40 points.

(*b*) Write down a second equation in x and y which satisfies this condition. **1**

10. (*c*) Calculate the score for David who gets 17 correct and 13 wrong. **4**

3

Solve the equation

$$2\tan x^\circ - 3 = 5, \qquad 0 \leq x \leq 360.$$

11. 4

Solve the equation

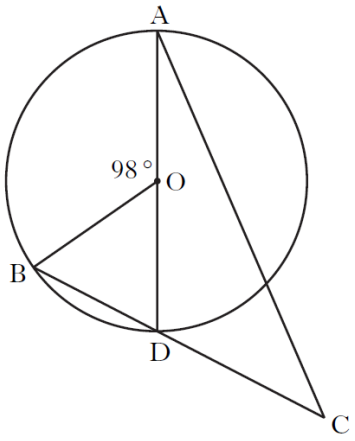
$$4x^2 - 7x + 1 = 0,$$

giving the roots correct to 1 decimal place.

12.

AD is a diameter of a circle, centre O.
B is a point on the circumference of the circle.
The chord BD is extended to a point C, outside the circle.
Angle BOA = 98 °.
DC = 9 centimetres. The radius of the circle is 7 centimetres.

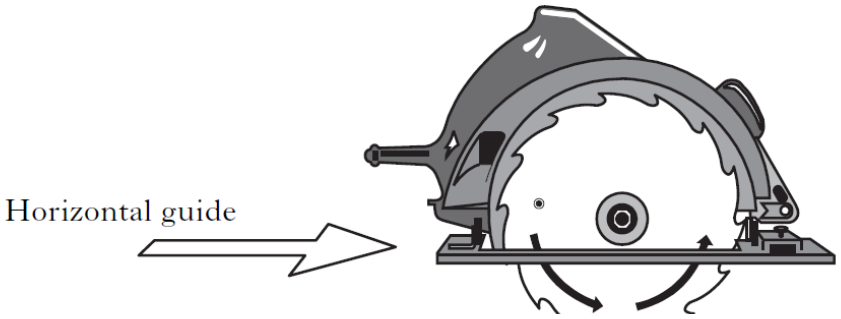
Calculate the length of AC.



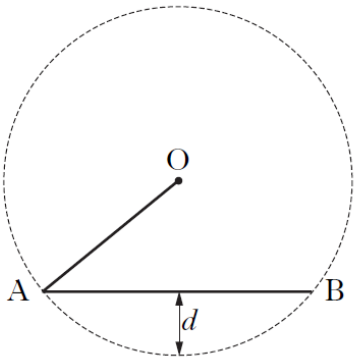
5

13.

A circular saw can be adjusted to change the depth of blade that is exposed below the horizontal guide.



The circle, centre O, below represents the blade and the line AB represents part of the horizontal guide.



This blade has a radius of 110 millimetres.

If AB has length 140 millimetres, calculate the depth, d millimetres, of saw exposed.

4

14.

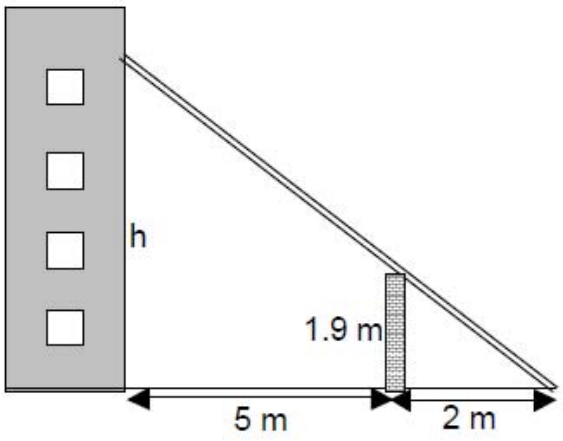
Prove that $\dfrac{\sin^2 A}{1-\sin^2 A} = \tan^2 A.$

2

Extra Questions

15.

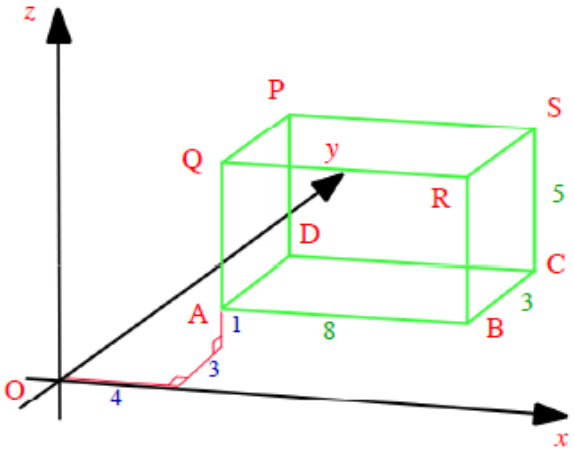
The foot of window cleaner's ladder is 2 metres from the base of a wall and rests against a block of flats a further 5 metres away.



Calculate h, how far up the block of flats the ladder reaches.

16.

Just as you can plot a point in 2-dimensions using 2 coordinates **A(4, 3)**, you can plot points in 3-dimensions like **A(4, 3, 1)**. (*See below*).



In the above figure, A is given by **A(4, 3, 1)**.
(*4 right, 3 back and 1 up*).
AB is parallel to the *x*-axis.

The cuboid measures 8 by 3 by 5 boxes.

(a) Write down the coordinates of the other 7 points making up the cuboid.

(b) Calculate the length of the diagonal **AC**.

(c) Calculate the length of space diagonal**AS**.

(d) ***Harder***. Calculate the length of the line **OS**.