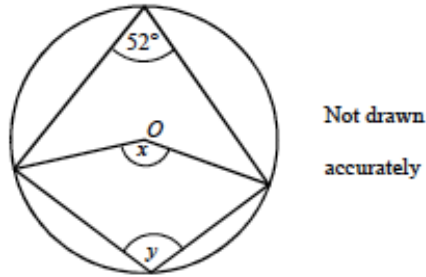


## Mock Revision C (F5 only) [49]

1.

- (a)  $O$  is the centre of the circle.



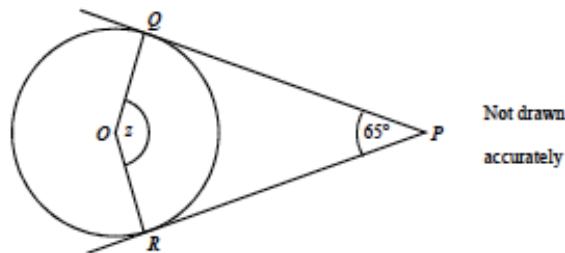
- (i) Find the value of  $x$ .

(1)

- (ii) Find the value of  $y$ .

(1)

- (b)  $PQ$  and  $PR$  are tangents to the circle centre  $O$ .  
 $\angle QPR$  is  $65^\circ$ .



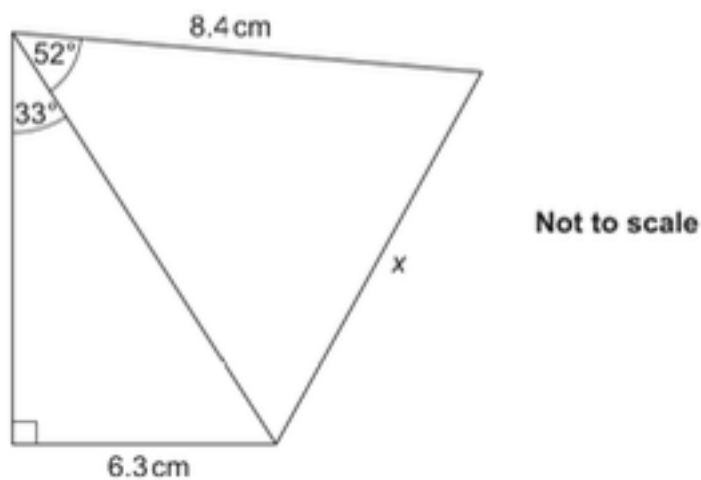
Calculate the size of angle  $QOR$  (marked  $z$  on the diagram).

(2)

(Total 4 marks)

2.

Calculate  $x$ .



(Total 5 marks)

3.

$$x^2 - 6x + 13 = (x - a)^2 + b$$

(a) Find the values of  $a$  and  $b$ .

(3)

(b) Hence find the minimum value of  $x^2 - 6x + 13$ .

(1)

(Total 4 marks)

4. **Non-calculator**

Ryan is using the quadratic formula to solve an equation of the form

$$ax^2 + bx + c = 0.$$

After substituting values into the quadratic formula, he gets

$$x = \frac{-3 \pm 3\sqrt{5}}{2}.$$

(a) Find a set of possible values for  $a$ ,  $b$  and  $c$ .

(b) Explain why there are other sets of possible values for  $a$ ,  $b$  and  $c$ .

(Total 6 marks)

5.

(a) Simplify fully the expression

$$\frac{8x^2 + 24x}{2x^2 + 5x - 3}$$

(3)

(b) You are given that  $(x + a)^2 + b = x^2 - 6x + 13$ .

Find the values of  $a$  and  $b$ .

(3)

(Total 6 marks)

6. **N.B. The second equation should read  $x^2 + y^2 = 2$ .**

Solve the simultaneous equations

$$y = 2x + 3$$

$$x^2 = y^2 = 2$$

You **must** show your working.

Do **not** use trial and improvement.

(Total 7 marks)

7.

(a) Simplify.

$$\left( \frac{x^4 y}{x^2 y^2} \right)^3$$

(b) Write as a single fraction in its simplest form.

(i)  $x + \frac{y}{2}$

(ii)  $\frac{4x}{x-2} - \frac{x}{x+3}$

(Total 6 marks)

8. Non-calculator

A circle has equation  $x^2 + y^2 = 80$ .

(a) Calculate the diameter of the circle.  
Give your answer as a surd in its simplest form.

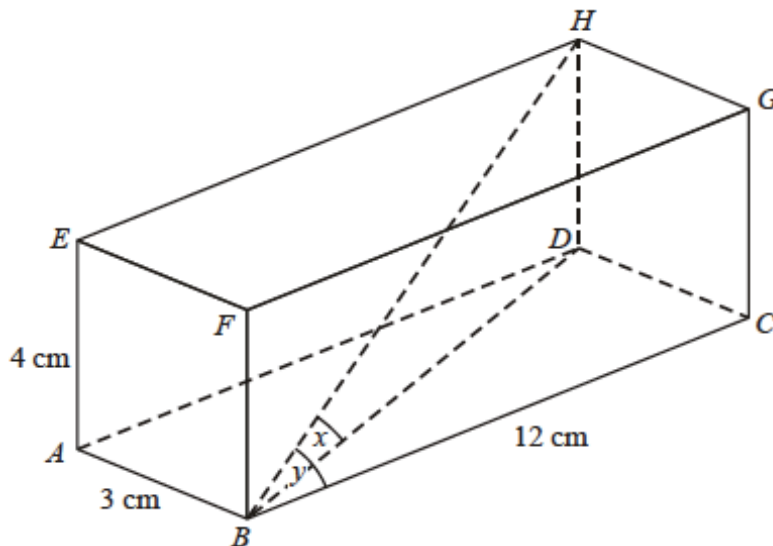
(b) Colin says that the point (5, 7) lies outside the circle.

Is Colin correct?  
Show your reasoning.

(c) Show that the line with equation  $y = \frac{1}{2}x + 10$  is a tangent to the circle. [6]

9.

The diagram shows a cuboid.  
 $AB = 3$  cm,  $AE = 4$  cm,  $BC = 12$  cm.



Not drawn accurately

(a) Find the length of  $BH$ .

(2)

(b) The angle between  $BH$  and  $BD$  is  $x$  and the angle between  $BH$  and  $BC$  is  $y$ .

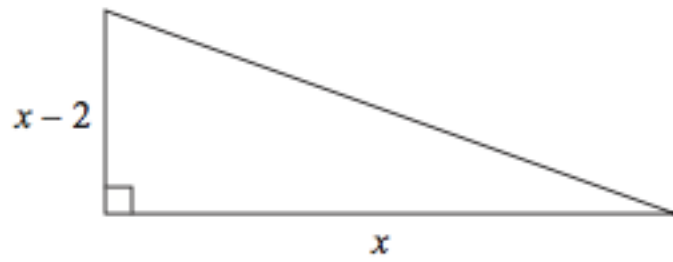
Which angle is bigger,  $x$  or  $y$ ?  
You **must** show your working.

(3)

(Total 5 marks)

10.

Here is a right-angled triangle.



All measurements are in centimetres.

The area of the triangle is  $2.5 \text{ cm}^2$ .

Find the perimeter of the triangle.

Give your answer correct to 3 significant figures.

You must show all of your working.

(Total 6 marks)