SQA Past paper questions

2019 – Paper 1 – Question 3

Circle C_1 has equation $x^2+y^2-6x-2y-26=0$.

Circle C_2 has centre $(4,-2)$.

The radius of C_2 is equal to the radius of C_1.

Find the equation of circle C_2. 2

Click here for video solution.

2019 – Paper 1 – Question 16

The point P has coordinates $(4,k)$.

C is the centre of the circle with equation $(x-1)^2+(y+2)^2=25$.

(a) Show that the distance between the points P and C is given by $\sqrt{k^2+4k+13}$. 2

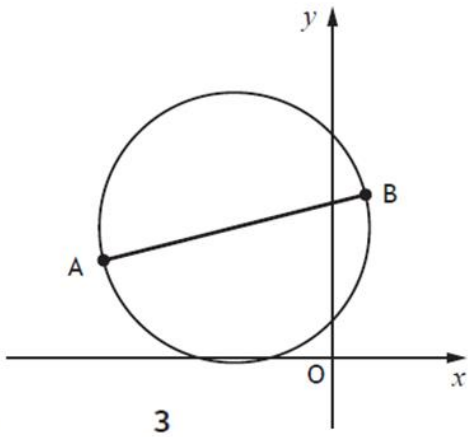
(b) Hence, or otherwise, find the range of values of k such that P lies outside the circle. 4

Click here for video solution.

2016 – Paper 1 – Question 4

A and B are the points $(-7, 3)$ and $(1, 5)$.

AB is a diameter of a circle.



Find the equation of this circle. 3

Click here for video solution.

2015 – Paper 1 – Question 14

The circle with equation $x^2 + y^2 - 12x - 10y + k = 0$ meets the coordinate axes at exactly three points.

What is the value of k? **2**

Click here for video solution.

2014 – Paper 2 – Question 8

Given that the equation

$$x^2 + y^2 - 2px - 4py + 3p + 2 = 0$$

represents a circle, determine the range of values of p. **5**

Click here for video solution.

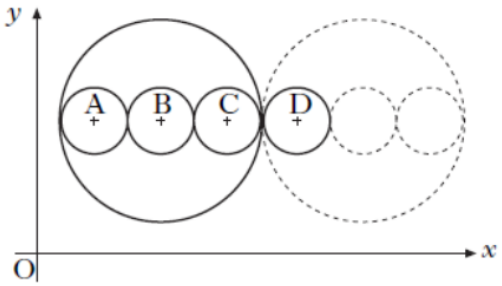
2007 – Paper 1 – Question 5

The large circle has equation $x^2 + y^2 - 14x - 16y + 77 = 0$.

Three congruent circles with centres A, B and C are drawn inside the large circle with the centres lying on a line parallel to the x-axis.

This pattern is continued, as shown in the diagram.

Find the equation of the circle with centre D. **5**



Click here for video solution.

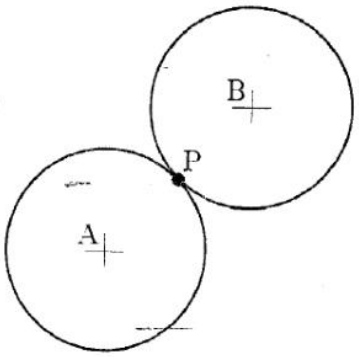
2006 – Paper 2 – Question 4

The circles with equations $(x-3)^2 + (y-4)^2 = 25$ and $x^2 + y^2 - kx - 8y - 2k = 0$ have the same centre.

Determine the radius of the larger circle. **5**

Click here for video solution.

2005 – Paper 1 – Question 2



Two congruent circles, with centres A and B, touch at P.

Relative to suitable axes, their equations are

$x^2 + y^2 + 6x + 4y - 12 = 0$ and
$x^2 + y^2 - 6x - 12y + 20 = 0$.

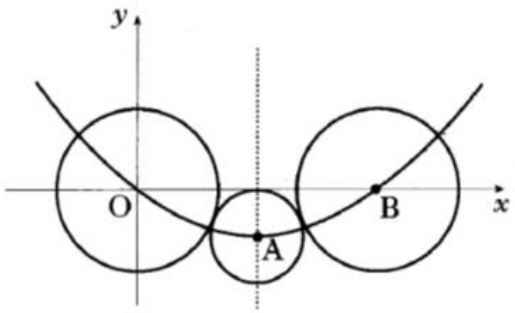
(*a*) Find the coordinates of P. **3**

(*b*) Find the length of AB. **2**

Click here for video solution.

2003 – Paper 1 – Question 11

- O, A and B are the centres of the three circles shown in the diagram below.
- The two outer circles are congruent and each touches the smallest circle.
- Circle centre A has equation $(x - 12)^2 + (y + 5)^2 = 25$.
- The three centres lie on a parabola whose axis of symmetry is shown by the broken line through A.



(*a*) (i) State the coordinates of A and find the length of the line OA. **2**

(ii) Hence find the equation of the circle with centre B. **3**

(*b*) The equation of the parabola can be written in the form $y = px(x + q)$.
Find the values of p and q. **2**

Click here for video solution.

2000 – Paper 1 – Question 6

For what range of values of k does the equation $x^2 + y^2 + 4kx - 2ky - k - 2 = 0$ represent a circle?

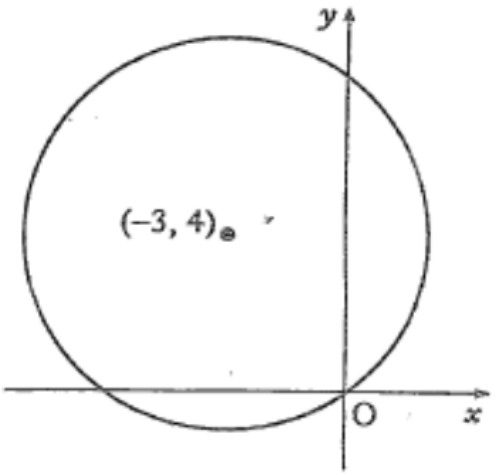
5

Click here for video solution.

1997 – Paper 1 – Question 12

Find the equation of the circle with centre $(-3, 4)$ and passing through the origin.

(2)

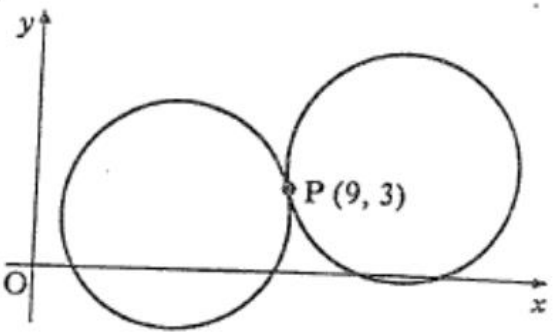


Click here for video solution.

1997 – Paper 1 – Question 12

Two identical circles touch at the point P (9, 3) as shown in the diagram. One of the circles has equation $x^2 + y^2 - 10x - 4y + 12 = 0$.

Find the equation of the other circle.



(5)

Click here for video solution.

1995 – Paper 1 – Question 9

Find the equation of the circle which has P(−2, −1) and Q(4, 5) as the end points of a diameter.

(3)

Click here for video solution.