Circles - Edexcel Past Exam Questions 2

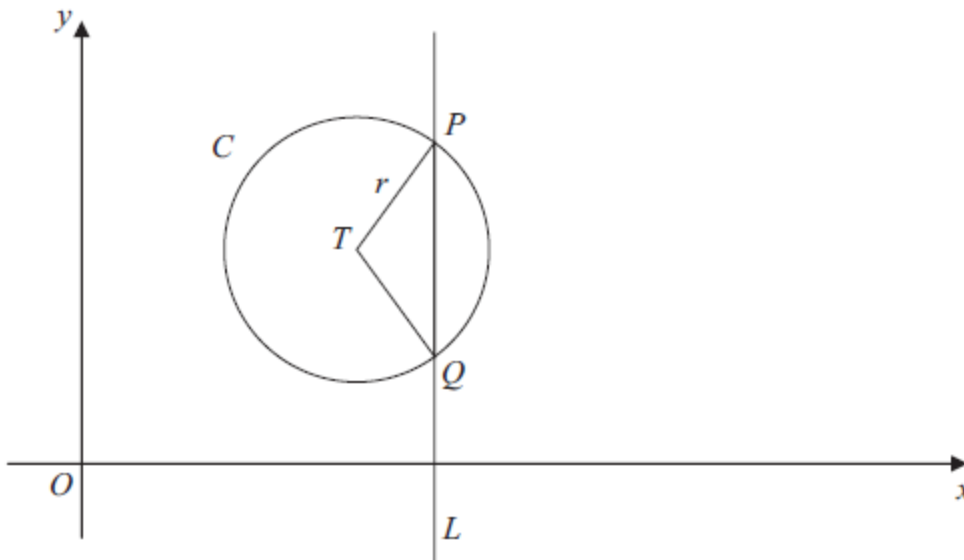**1.** A circle *C* has centre (−1, 7) and passes through the point (0, 0). Find an equation for *C*.

(4)

Jan 12 Q2

2.

Figure 1

The circle *C* with centre *T* and radius *r* has equation

$$x^2 + y^2 - 20x - 16y + 139 = 0.$$

(*a*) Find the coordinates of the centre of *C*. **(3)**

(*b*) Show that *r* = 5 **(2)**

The line *L* has equation *x* = 13 and crosses *C* at the points *P* and *Q* as shown in Figure 1.

(*c*) Find the *y* coordinate of *P* and the *y* coordinate of *Q*. **(3)**

June 12 Q3 *(edited)*

3. The circle C has equation

$$x^2 + y^2 - 20x - 24y + 195 = 0.$$

The centre of C is at the point M.

(*a*) Find

    (i) the coordinates of the point M,

    (ii) the radius of the circle C. **(5)**

N is the point with coordinates (25, 32).
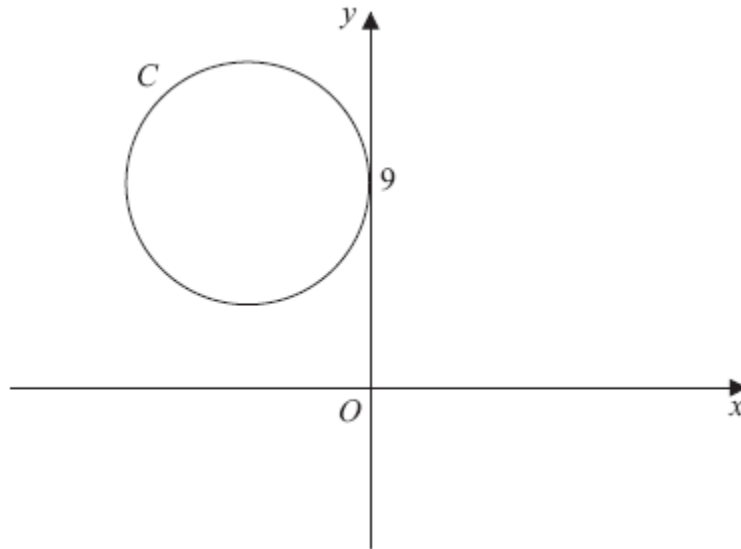
(*b*) Find the length of the line MN. **(2)**

The tangent to C at a point P on the circle passes through point N.

(*c*) Find the length of the line NP. **(2)**

Jan 13 Q5

4.

Figure 4

The circle C has radius 5 and touches the y-axis at the point $(0, 9)$, as shown in Figure 4.

(*a*) Write down an equation for the circle C, that is shown in Figure 4.　　　　　**(3)**

A line through the point $P(8, -7)$ is a tangent to the circle C at the point T.

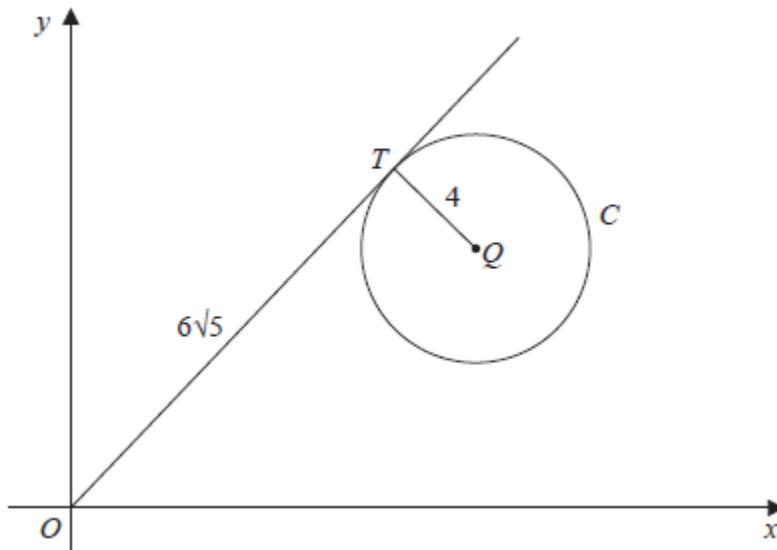(*b*) Find the length of PT.　　　　　**(3)**

June 13 Q10

5.

Figure 3

Figure 3 shows a circle C with centre Q and radius 4 and the point T which lies on C. The tangent to C at the point T passes through the origin O and $OT = 6\sqrt{5}$.

Given that the coordinates of Q are $(11, k)$, where k is a positive constant,

(a) find the exact value of k,

(3)

(b) find an equation for C.

(2)

June 14 Q5

6. The circle *C*, with centre *A*, passes through the point *P* with coordinates (–9, 8) and the point *Q* with coordinates (15, –10).

Given that *PQ* is a diameter of the circle *C*,

(*a*) find the coordinates of *A*, **(2)**

(*b*) find an equation for *C*. **(3)**

A point *R* also lies on the circle *C*.
Given that the length of the chord *PR* is 20 units,

(*c*) find the length of the shortest distance from *A* to the chord *PR*.
Give your answer as a surd in its simplest form. **(2)**

(*d*) Find the size of the angle *ARQ*, giving your answer to the nearest 0.1 of a degree. **(2)**
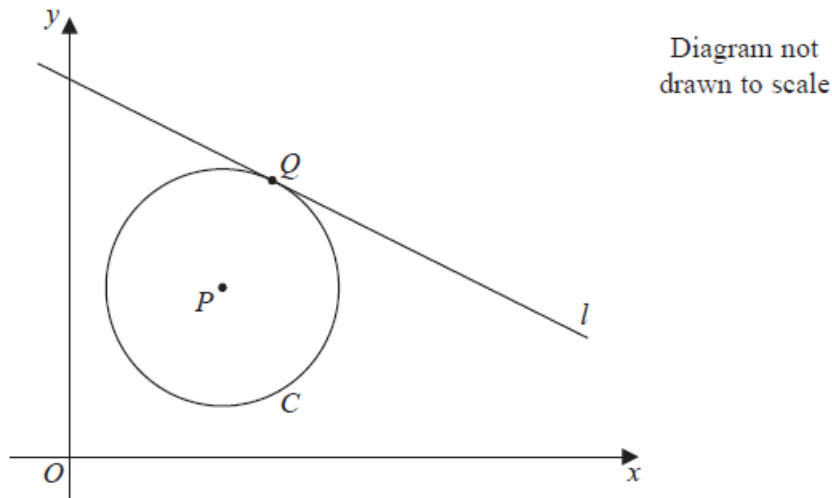**June 14(R) Q10**

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7. A circle *C* with centre at the point (2, –1) passes through the point *A* at (4, –5).

(*a*) Find an equation for the circle *C*. **(3)**

(*b*) Find an equation of the tangent to the circle *C* at the point *A*, giving your answer in the form $ax + by + c = 0$, where *a*, *b* and *c* are integers. **(4)**
June 15 Q2

8.

Diagram not drawn to scale

Figure 2

The circle *C* has centre *P*(7, 8) and passes through the point *Q*(10, 13), as shown in Figure 2.

(*a*) Find the length *PQ*, giving your answer as an exact value. **(2)**

(*b*) Hence write down an equation for *C*. **(2)**

The line *l* is a tangent to *C* at the point *Q*, as shown in Figure 2.

(*c*) Find an equation for *l*, giving your answer in the form $ax + by + c = 0$, where *a*, *b* and *c* are integers. **(4)**

June 16 Q3

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9.   The circle *C* has equation

$$x^2 + y^2 - 10x + 6y + 30 = 0$$

Find

(*a*) the coordinates of the centre of *C*, **(2)**

(*b*) the radius of *C*, **(2)**

(*c*) the *y* coordinates of the points where the circle *C* crosses the line with equation *x* = 4, giving your answers as simplified surds. **(3)**

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