6.

Figure 3
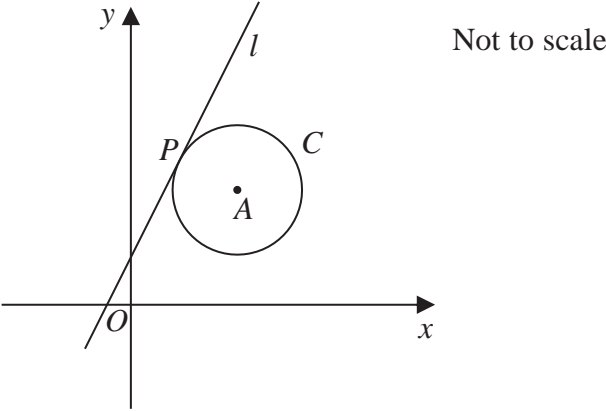
The circle *C* has centre *A* with coordinates (7, 5).

The line *l*, with equation $y = 2x + 1$, is the tangent to *C* at the point *P*, as shown in Figure 3.

(a) Show that an equation of the line *PA* is $2y + x = 17$

(3)

(b) Find an equation for *C*.

(4)

The line with equation $y = 2x + k$, $k \neq 1$ is also a tangent to *C*.

(c) Find the value of the constant *k*.

(3)