

**M1.****Alternative method 1** $P(1, 3)$  or  $y = 3$  or grad  $OP = 3$ **B1**

$$\text{grad } PQ = -\frac{1}{\text{their } 3} \text{ or } -\frac{1}{3}$$

**M1**

$$y = \left(\text{their } -\frac{1}{3}\right)x + c$$

and substitutes  $(1, \text{their } 3)$ 

or

$$y - \text{their } 3 = \left(\text{their } -\frac{1}{3}\right)(x - 1)$$

$$\text{oe} \\ \frac{\text{their } 3}{x-1} \text{ or } -\frac{\text{their } 3}{x-1}$$

**M1dep**Substitutes  $y = 0$  in their equation

$$-\frac{\text{their } 3}{x-1} = \text{their } -\frac{1}{3}$$

**M1dep** $(10, 0)$ **A1****Alternative method 2** $P(1, 3)$  or  $y = 3$  or grad  $OP = 3$

**B1**

$$\frac{\text{their } 3}{1} = \frac{QN}{\text{their } 3}$$

**M1dep**

their 3 × their 3 or 9

**M1dep**

$$\tan \text{PON} = \frac{\text{their } 3}{1}$$

*N is on the x-axis*

*PN is perpendicular to the x-axis*

**M1**

(10, 0)

**A1**

**[5]**

**M2.**

(a) Circle drawn, centre (0, 0), radius 4

**B1**

(b)  $x^2 + y^2 = 16$  or  $x^2 + y^2 = 4^2$   
oe

**B1**

**[2]**