

**10.** A circle  $C$  has equation

$$x^2 + y^2 - 4x + 8y - 8 = 0$$

(a) Find

- (i) the coordinates of the centre of  $C$ ,
- (ii) the exact radius of  $C$ .

**(3)**

The straight line with equation  $x = k$ , where  $k$  is a constant, is a tangent to  $C$ .

(b) Find the possible values for  $k$ .

**(2)**