

**11** The coordinates of points  $A$ ,  $B$  and  $C$  are  $A(5, -2)$ ,  $B(10, 3)$  and  $C(2p, p)$ , where  $p$  is a constant.

(a) Given that  $AC$  and  $BC$  are equal in length, find the value of the fraction  $p$ . [3]

This image shows a full page of white paper with horizontal dashed lines, typical of primary school writing paper. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

(b) It is now given instead that  $AC$  is perpendicular to  $BC$  and that  $p$  is an integer.

(i) Find the value of  $p$ . [4]

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[illegible]

- (ii) Find the equation of the circle which passes through  $A$ ,  $B$  and  $C$ , giving your answer in the form  $x^2 + y^2 + ax + by + c = 0$ , where  $a$ ,  $b$  and  $c$  are constants. [4]

[illegible]