

Question	Answer	Marks	AOs	Guidance
8	<p>EITHER</p> <p>Midpoint AB is (3, 1)</p> <p>Gradient of AB is $\frac{4 - (-2)}{7 - (-1)} \left(= \frac{6}{8} = \frac{3}{4} \right)$</p> <p>Gradient of perpendicular $-\frac{4}{3}$</p> <p>Equation of perpendicular bisector</p> $y - 1 = -\frac{4}{3}(x - 3)$ <p>Solve the simultaneous equations</p> $4x + 3y = 15$ $2x + y = k$ $y = 15 - 2k, \quad x = \frac{1}{2}(3k - 15)$ <p>giving P $\left(\frac{1}{2}(3k - 15), 15 - 2k \right)$</p>	<p>B1</p> <p>M1</p> <p>M1</p> <p>M1</p> <p>M1</p> <p>A1</p> <p>A1</p> <p>[7]</p>	<p>3.1a</p> <p>3.1a</p> <p>1.1a</p> <p>1.1a</p> <p>1.1a</p> <p>1.1</p> <p>1.1</p>	<p>Seen or implied</p> <p>Must be correct way up – allow one slip</p> <p>negative reciprocal FT their gradient of AB</p> <p>FT their gradient. Condone A or B used instead of M. Do not allow if their gradient of AB used.</p> <p>Attempt to eliminate one variable</p> <p>cao</p> <p>cao</p> <p>Allow this M1 for showing the perpendicular to the given line is $\frac{1}{2}$.</p>
	<p>OR</p> <p>P is of the form $(x, k - 2x)$</p> <p>and is equidistant from A and B</p> $(x + 1)^2 + (y + 2)^2 = (x - 7)^2 + (y - 4)^2$ $(x + 1)^2 + (k - 2x + 2)^2 = (x - 7)^2 + (k - 2x - 4)^2$ $-8x + 1 = 60 - 12k$ <p>So $x = \frac{1}{2}(3k - 15)$</p> <p>and $y = 15 - 2k$</p> <p>P is $\left(\frac{1}{2}(3k - 15), 15 - 2k \right)$</p>	<p>B1</p> <p>M1</p> <p>M1</p> <p>M1</p> <p>M1</p> <p>A1</p> <p>A1</p> <p>[7]</p>	<p></p> <p></p> <p></p> <p></p> <p></p> <p>A1</p> <p>A1</p>	<p>Seen or implied</p> <p>Finding at least one distance</p> <p>Equating distances</p> <p>Substituting for y</p> <p>Attempt to simplify</p> <p>cao</p> <p>cao</p>