

| Question |     | Answer                                                                  | Marks      | AO          | Guidance                                                                                                                                                   |
|----------|-----|-------------------------------------------------------------------------|------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 11       | (a) | $(x - 4)^2 + (y + 1)^2 = 13^2$ <b>oe</b>                                | <b>M1</b>  | <b>1.1</b>  | Correct form; allow either one sign error within brackets or 13 not squared but not both                                                                   |
|          |     | all correct <b>isw</b>                                                  | <b>A1</b>  | <b>1.1</b>  |                                                                                                                                                            |
|          |     |                                                                         | <b>[2]</b> |             |                                                                                                                                                            |
| 11       | (b) | Gradient of radius is $\left[ \frac{11--1}{9-4} = \right] \frac{12}{5}$ | <b>B1</b>  | <b>1.1</b>  | <b>FT</b> negative reciprocal of their numerical gradient so<br>$y = -\frac{5}{12}x + c \Rightarrow 11 = -\frac{5}{12} \times 9 + c \Rightarrow c = \dots$ |
|          |     | Gradient of tangent is $-\frac{5}{12}$                                  | <b>M1</b>  | <b>1.1</b>  |                                                                                                                                                            |
|          |     | $y - 11 = -\frac{5}{12}(x - 9)$ <b>oe</b>                               | <b>M1</b>  | <b>1.1a</b> |                                                                                                                                                            |
|          |     | $y = -\frac{5}{12}x + \frac{59}{4}$ or $12y + 5x = 177$ <b>oe</b>       | <b>A1</b>  | <b>1.1</b>  |                                                                                                                                                            |
|          |     |                                                                         | <b>[4]</b> |             | allow any correct simplified form                                                                                                                          |