

| Q     | Marking instructions  | AO   | Marks    | Typical solution   |
|-------|---|------|----------|--|
| 18(a) | Subtracts given vectors with at least one component correct for $\overline{AB}$ or $\overline{BA}$<br>or<br>Finds difference between $\mathbf{i}$ and $\mathbf{j}$ components with at least one correct, may be seen on a diagram | 1.1a | M1       | $\begin{bmatrix} 13 \\ 5 \end{bmatrix} - \begin{bmatrix} 5 \\ -1 \end{bmatrix} = \begin{bmatrix} 8 \\ 6 \end{bmatrix}$ $\overline{AB} = \begin{bmatrix} 8 \\ 6 \end{bmatrix}$ <p>Distance = <math>\sqrt{8^2 + 6^2}</math></p> <p>Distance = 10 m</p> |
|       | Uses Pythagoras for their $\mathbf{i}$ and $\mathbf{j}$ component differences   | 1.1a | M1       |  |
|       | Shows distance between A and B is 10 metres AG<br>Condone missing units   | 1.1b | A1       |  |
|       | <b>Subtotal</b>   |      | <b>3</b> |  |

| Q     | Marking instructions   | AO   | Marks    | Typical solution   |
|-------|--|------|----------|--|
| 18(b) | Selects $s = ut + \frac{1}{2}at^2$<br>and substitutes given values for $u$ , $t$ and $s$           | 3.3  | M1       | $s = ut + \frac{1}{2}at^2$ $10 = 6 + 2a$ $a = 2$ $R = 0.15 \times 2 = 0.3$ |
|       | Obtains $a = 2$  | 1.1b | A1       |  |
|       | Obtains value for $R$ using $0.15 \times$ their value for $a$<br>Final value for $R$ must be $> 0$ | 3.4  | B1F      |  |
|       | <b>Subtotal</b>  |      | <b>3</b> |  |

|  |                          |  |          |  |
|--|--------------------------|--|----------|--|
|  | <b>Question 18 Total</b> |  | <b>6</b> |  |
|--|--------------------------|--|----------|--|