| Question Number | Scheme | Marks |
|---|---|---|
| **3(a)** | $\frac{a+b}{2}=6$ $\quad \frac{1}{12}(b-a)^2=3$ | B1 |
| | $a+b=12$ and $b-a=\pm 6$ **or** $a^2-12a+27=0$ **or** $b^2-12b+27=0$ | dM1 |
| | $a=3,\ b=9$ | A1 |
| | | (3) |
| **(b)** | $[\mathrm{P}(Y>6+\sqrt{3})=]\ \frac{"9"-\left(6+\sqrt{3}\right)}{"9"-"3"}$ | M1 |
| | $=\frac{3-\sqrt{3}}{6}$ or $0.211(32\ldots)$ awrt 0.211 | A1 |
| | | (2) |
| **(c)** | $\left[\mathrm{F}(y)=\right]\begin{cases}0 & y<3\\ \frac{y-3}{6} & 3\leqslant y\leqslant 9\\ 1 & y>9\end{cases}$ | B1<br>B1 |
| | | (2) |
| | | **Total 7** |

| | | Notes |
|---|---|---|
| **(a)** | B1 | for correct equations for both mean and variance. Implied by the dM1 |
| | dM1 | dependent on B1. A correct pair of linear equations or a correct quadratic in 1var. |
| | A1 | must state $a = 3$ and $b = 9$ or write [3, 9] not just write 3 and 9 . If two answers gained the incorrect one must be eliminated<br>NB correct answer with no working gains 3/3 |
| **(b)** | M1 | $\frac{"their\ b"-\left(6+\sqrt{3}\right)}{"their\ b"-"their\ a"}$ or $1-\frac{\left(6+\sqrt{3}\right)-"their\ a"}{"their\ b"-"their\ a"}$ Allow use of awrt7.73 for $6+\sqrt{3}$ Only allow 7.7 if $6+\sqrt{3}$ is seen. If $a$ and $b$ are incorrect working must be shown to award this mark. |
| | A1 | $\frac{3-\sqrt{3}}{6}$ oe or awrt 0.211 |
| **(c)** | | $\left[\mathrm{F}(y)=\right]\begin{cases}0 & y<"a"\\ \frac{y-"\text{their } a"}{"\text{their } b-a"} & "\text{their } a"\leqslant y\leqslant "\text{their } b"\\ 1 & y>"b"\end{cases}$<br>Award B1B1 if all 3 lines correct using the same letter (ft " their $a$ and $b$") |
| | | Award B1 B0 if all correct but a mixture of letters (ft " their $a$ and $b$") |
| | | Award B1B0 if just the 2nd line is correct all same letter used in the function and range **or** just the 1st and 3rd line correct with the same letter used for both ranges. Allow otherwise once<br>NB Allow < signs for $\leqslant$ and vice versa and > for $\geqslant$ and Ignore F($y$) |