| Question Number | Scheme | Marks |
|---|---|---|
| 5 (a) | $P(X < 38.8) = P\left(Z < \frac{38.8-40}{4}\right)\left[= P\left((Z < -0.3)\right)\right]$ | M1 |
| | $= 1 - 0.6179 = 0.3821*$ | A1* |
| | | (2) |
| (b) | P(Qualify) = $1-(0.3821)^3$ or $1-0.3821+0.3821\times(1-0.3821)+0.3821^2\times(1-0.3821)$ | M1 |
| | $[= 0.9442]$ | |
| | $P(X > 44) = P\left(Z > \frac{44-40}{4}\right)\left[= P\left((Z > 1)\right)\right]$ | M1 |
| | $[= 1 - 0.8413] = 0.1587$ | A1 |
| | $P(X > 44 \text{ on 2nd attempt} \mid \text{Qualify}) = \frac{0.3821\times'0.1587'}{'0.9442'}$ | M1 |
| | 0.06422... awrt 0.0642 | A1 |
| | | (5) |

| | Notes | Total 7 |
|---|---|---|
| (a) | **M1** | For standardising using 38.8, 40 and 4 (allow ±) |
| | **A1*** | Must see 1 – 0.6179 or we must see 0.38209 or 0.38208… or better<br>Answer is given so no incorrect working can be seen (but condone poor probability notation) |
| (b) | **M1** | For a correct method to find the probability of qualifying |
| | **M1** | For standardising using 44, 40 and 4 (implied by 1 – 0.8413 or awrt 0.1587) |
| | **A1** | awrt 0.16 |
| | **M1** | For a correct ratio of probabilities ft their 0.1587 and their 0.9442.<br>Use of 0.6179 in the denominator is M0 |
| | **A1** | awrt 0.0642 |