| Question Number | Scheme | Marks |
|---|---|---|
| **3. (a)** | $P(3 < X < 7) = F(7) - F(3)$ [= 0.7 – 0.2]<br>**0.5** | M1<br>A1<br>(2) |
| **(b)** | $a = \frac{0.4-0}{4-2}$ $b = \frac{0}{6-4}$ $c = \frac{1-0.4}{8-6}$<br>**$a$ = 0.2 $b$ = 0 $c$ = 0.3** | M1<br>A1 A1<br>(3) |
| **(c)** | $E(X) = \int_2^4 "0.2"x\,dx + \int_4^6 "0"x\,dx + \int_6^8 "0.3"x\,dx$<br>$E(X) = \left[\frac{0.2x^2}{2}\right]_2^4 + \left[\frac{0.3x^2}{2}\right]_6^8$<br>= **5.4**<br>**Alternative**<br>$E(X) = 3\times p + 7\times 2\times$"their $c$" or $3\times 2\times$"their $a$"$+ 7\times p$ where $0 < p < 1$<br>$= 3\times$"0.4"$+ 7\times$"0.6"<br>= **5.4** | M1<br>A1ft<br>A1<br>(3)<br>**Alternative**<br>M1<br>A1ft<br>A1<br>**[8 marks]** |
| | **Notes** | |
| **(a)** | M1 for writing or using F(7) – F(3) Implied by answer 0.5 | |
| **(b)** | M1 for attempt to find the gradient of at least 1 line segment (may be implied by either $a$ or $c$ correct)<br>1st A1 two values correct<br>2nd A1 all three values correct | |
| **(c)** | M1 for a correct expression for $\int xf(x)\,dx$ (ignore limits) using their $a$, $b$ and $c$ (Condone $a$, $b$ and $c$ as a function of $x$) and an attempt to integrate ($x^n \to x^{n+1}$). No need to see $\int_4^6 "0"x\,dx$ if $b = 0$ otherwise it must be present<br>A1ft correct integration with correct limits (ft their constants $a$, $b$ and $c$ from part (b))<br>A1 5.4 oe<br>**Alternative**<br>M1 must have 3, 7 and one half correct ft their values for $a$/$c$.<br>A1ft $3\times 2\times$"their $a$"$+ 7\times 2\times$"their $c$"<br>A1 5.4 oe | |