| Question | Answer | Marks | Partial Marks |
|---|---|---|---|
| 8(a) | Factorises or solves<br>$3t^2 - 30t + 72 = 0$<br>or $t^2 - 10t + 24 = 0$ | **M1** | |
| | $t = 4$, $t = 6$ | **A1** | |
| | Integrates $v$ to find F($t$):<br>$\frac{3t^3}{3} - \frac{30t^2}{2} + 72t$ | **M2** | **M1** for any two terms correct |
| | Correct substitution for<br>F(6) – F(4) or F(4) – F(6) | **M1** | **dep** on at least **M1** for integration<br>**FT** *their* 4 and *their* 6 provided they are **both positive** |
| | 4 (m) | **A1** | **dep** on all previous marks being awarded |
| 8(b) | $[a =] 6t - 30$ | **B1** | |
| | [When $t = 2$: $a = 6(2) - 30 =$]<br>$-18$ (ms$^{-2}$) cao | **B1** | |
| 9 | Correctly eliminates $x$ or $y$ e.g.<br>$4x^2 + 3x\left(-\frac{4}{x}\right) + \left(-\frac{4}{x}\right)^2 = 8$ oe<br>or $4\left(-\frac{4}{y}\right)^2 + 3\left(-\frac{4}{y}\right)y + y^2 = 8$ oe | **M1** | |
| | Rearranges to a 3-term quadratic in $x^2$ or $y^2$ soi e.g.<br>$4x^4 - 20x^2 + 16 = 0$<br>or $y^4 - 20y^2 + 64 = 0$ | **A1** | |
| | Factorises or solves *their* 3-term quadratic in $x^2$ or $y^2$ soi :<br>$(x^2 - 1)(x^2 - 4)$<br>or $(y^2 - 16)(y^2 - 4)$ | **M1** | |
| | $x^2 = 1$ , $x^2 = 4$ oe, nfww<br>or $y^2 = 16$ , $y^2 = 4$ oe, nfww | **A1** | |
| | $x = \pm 1$ $x = \pm 2$<br>$y = \mp 4$ $y = \mp 2$ oe, nfww | **A2** | **A1** for all 4 $x$ values or all 4 $y$ values |
| 10(a) | $\frac{1}{3}e^{3x+3} + c$ or $\frac{1}{3}e^3 \times e^{3x} + c$ nfww | **B2** | **B1 for** $ke^{3x+3}$ or $ke^3 \times e^{3x}$ where $k \neq \frac{1}{3}$ or 0 |