| Question | Answer | Marks | Partial Marks |
|---|---|---|---|
| 6(c) | $\frac{\sqrt{6}+\sqrt{2}}{4}=\frac{x}{\sqrt{6}-\sqrt{2}}$<br>or<br>$\frac{1}{2}\times \textit{their}\, 2\sqrt{3}\times x=$<br>$\frac{1}{2}\times\left(\sqrt{6}-\sqrt{2}\right)\times\left(\sqrt{6}+\sqrt{2}\right)\times\sin 60$<br>[where $x$ is the perpendicular from $A$ to $BC$] | **M1** | Complete method |
| | $x=\frac{\left(\sqrt{6}-\sqrt{2}\right)\left(\sqrt{6}+\sqrt{2}\right)}{4}=\frac{6-2}{4}=1$<br>or<br>$x=\frac{(6-2)}{2\sqrt{3}}\times\frac{\sqrt{3}}{2}=\frac{4}{4}=1$ | **A1** | |
| 7(a) | $\left[\frac{\mathrm{d}y}{\mathrm{d}x}=\right]\frac{1}{2}\mathrm{e}^{2x}-(x+1)^{-1}+\frac{5}{2}$ oe | **B3** | **M2** for $\frac{1}{2}\mathrm{e}^{2x}-(x+1)^{-1}+c$ oe<br>or **M1** for any two terms correct from $\frac{1}{2}\mathrm{e}^{2x}$, $-(x+1)^{-1}$, $+c$ |
| 7(b) | $[y=]\frac{1}{4}\mathrm{e}^{2x}-\ln(x+1)$ | **M1** | |
| | $+\textit{their}\,\frac{5}{2}\times x+\mathrm{d}$ | **M1** | **FT** *their c* from **(a)**, providing $c\neq 0$ |
| | $[y=]\frac{1}{4}\mathrm{e}^{2x}-\ln(x+1)+\frac{5}{2}x+\frac{15}{4}$ oe | **A1** | |

| Question | Answer | Marks | Partial Marks |
|---|---|---|---|
| 8(a) | [Gradient =] $\frac{15.4-10.4}{4-2}$ oe soi | **M1** | |
| | 10.4 = *their*2.5 × 2 + *c* or 15.4 = *their*2.5 × 4 + *c*<br>or<br>$\frac{y-10.4}{x-2}=$ *their*2.5 or $\frac{y-15.4}{x-4}=$ *their*2.5 | **M1** | **FT** *their* gradient |
| | [Gradient = ] 2.5 soi and [intercept =] 5.4 soi | **A1** | |
| | $\sqrt{y}=2.5\log_2(x+1)+5.4$ oe isw | **A1** | |
| | **Alternative method** | | |
| | 10.4 = 2*m* + *c* and 15.4 = 4*m* + *c*<br>and solving to find *m* or *c* | **(M1)** | |
| | Use *their m* or *c* to find *their c* or *m* | **(M1)** | |
| | *m* = 2.5 and *c* = 5.4 | **(A1)** | |
| | $\sqrt{y}=2.5\log_2(x+1)+5.4$ oe isw | **(A1)** | |
| 8(b) | $\frac{5929}{25}$ or 237.16 | **B1** | |
| 8(c) | $5=$ *their*$2.5\log_2(x+1)+$ *their*$5.4$<br>and rearrange to make $\log_2(x+1)$ the subject | **M1** | **FT** *their* equation from **(a)** of correct form with $m \neq 1$ or 0, and $c \neq 0$<br><br>Condone any base |
| | $-\frac{4}{25}=\log_2(x+1)$ oe | **A1** | Condone any base |
| | $x=-0.105$ or –0.1049[74…] rot to 4 or more sf | **A1** | |
| 9(a) | $\frac{dy}{dx}=3x^2+2x-4$ | **M2** | **M1** for any two terms correct |
| | $x=1\rightarrow\frac{dy}{dx}=1$ | **A1** | |
| | $[m_\perp =]\ -1$ | **M1** | **FT** $\frac{-1}{\text{their}1}$ |
| | $y-4=-1(x-1)$ oe isw | **A1** | **FT** *their* $m_\perp$ |