| Question | Answer | Marks | Guidance |
|---|---|---|---|
| 8(a) | $\frac{\pi}{3}$ | **2** | **M1** for angle $AOB$: $\frac{2\pi}{3}$<br>or angle $AQO$: $\frac{\pi}{6}$<br>or angle $OAB$: $\frac{\pi}{6}$<br>or e.g. $\cos(AOB) = -\frac{1}{2}$<br>or $\sin\left(\frac{1}{2}AOB\right) = \frac{\sqrt{3}}{2}$<br>or $AQ$ or $BQ = 2\sqrt{3}$<br>If 0 scored, **SC1** for answer of 1.047 rads |

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| Question | Answer | Marks | Guidance |
|---|---|---|---|
| 8(b) | $2\sqrt{3}-\frac{2\pi}{3}$ or $\frac{6\sqrt{3}-2\pi}{3}$ oe nfww | **6** | **B5** correct calculation that simplifies to give shaded area e.g. $\left(\frac{4\pi}{3}-\sqrt{3}\right)-\left(2\pi-3\sqrt{3}\right)$<br>OR<br>**B1** for sector $AOB$: $\frac{1}{2}\times 2^2\times\frac{2\pi}{3}$ oe<br>**B1** for $\Delta AOB$ or $\Delta AOQ$ or $\Delta BOQ$: $\frac{1}{2}\times 2^2\times\sin\frac{2\pi}{3}$<br>or $\frac{1}{2}\times 2\times 2\sqrt{3}\sin\frac{\pi}{6}$ oe<br>**B1** for sector $AQB$: $\frac{1}{2}\times\left(2\sqrt{3}\right)^2\times\frac{\pi}{3}$ oe<br>**B1** for $\Delta AQB$: $\frac{1}{2}\left(2\sqrt{3}\right)^2\sin\frac{\pi}{3}$ oe<br>OR<br>**B2 FT** *their* exact angles for a correct calculation for any two of these areas<br>OR<br>**B2** for sector $AOB$: 4.188; $\Delta AOB$ or $\Delta AOQ$ or $\Delta BOQ$: 1.732; sector $AQB$: 6.282; $\Delta AQB$: 5.195[5] from using 1.047 rads<br>OR<br>**B1FT** *their* exact angles for a correct calculation for any one of these areas<br>OR<br>**B1** for one of these areas using 1.047 rads |
| 9(a) | Points plotted at<br>$\begin{array}{\|c\|c\|c\|c\|c\|}\hline \ln x & -0.5 & 1.5 & 2.5 & 3.5 \\ \hline \ln y & 0.5 & 1.5 & 2 & 2.5 \\ \hline\end{array}$ soi<br>and single, ruled, straight line of best fit drawn | **B2** | **B1** for at least 3 correctly plotted points |