

You will often be asked to work out whether stationary points are maxima or minima, but you will almost never be asked to use a specific method to determine which.

You can use the normal method or simply look at the values at those points to see whether they are maxima or minima. The functions which are given are all relatively symmetrical and so you can use this basic analytic method. the functions which are not symmetrical are usually very easy to differentiate and so the normal method is easy.

Or if you find a contour which passes through a stationary point then that stationary point must be a saddle point.

You can further verify whether values are maxima by checking whether values which are marginally greater and marginally smaller than a value (ie sub in $x \pm \delta x$ and $y \pm \delta y$ for small $\delta x, \delta y$).