| | | | | | |
|---|---|---|---|---|---|
| **19** | $\left(\frac{dy}{dx} =\right) 3x^2 - 16x - 12$ | | 5 | M1 | for differentiation with at least 2 terms correct |
| | $"3x^2 - 16x - 12" = 0$ | | | M1ft | (dep on previous M1) for their $\frac{dy}{dx} = 0$ |
| | eg $(3x+2)(x-6)(=0)$<br>**or** $(x =) \frac{-(-16) \pm \sqrt{(-16)^2 - 4\times3\times(-12)}}{2\times3}$<br>**or** $3\left[\left(x - \frac{8}{3}\right)^2 - \frac{64}{9}\right] - 12 (= 0)$ | | | M1ft | (dep on 1st M1)<br><br>for the correct $x$ value (of 6) – ignore other $x$ value<br>**OR**<br>for solving ***their*** 3 term quadratic equation using any correct method<br>(if factorising, allow brackets which expanded give 2 out of 3 terms correct)<br>(if using formula allow one sign error and some simplification – allow as far as $\frac{16 \pm \sqrt{256+144}}{6}$)<br>(if completing the square then as far as shown on LHS)<br><br>The award of this mark implies the previous M mark |
| | eg $6^3 - 8\times6^2 - 12\times6 + 5 (= -139)$ | | | M1ft | (dep on 1st M1) for $x = 6$ substituted into correct equation for curve $C$<br>**OR**<br>(dep on 1st M1 and 2 values for $x$) for ***their*** greatest $x$ value substituted into correct equation for curve $C$<br>(ignore any attempt to substitute their least $x$ value) |
| | *Working required* | (6, –139) | | A1 | (dep on M2) cao |
| | | | | | **Total 5 marks** |