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A curve has parametric equations  $x = \frac{t}{1+t^3}$ ,  $y = \frac{t^2}{1+t^3}$ , where  $t \neq -1$ .

**(i) In this question you must show detailed reasoning.**

Determine the gradient of the curve at the point where  $t = 1$ .

**[5]**

**(ii) Verify that the cartesian equation of the curve is  $x^3 + y^3 = xy$ .**

**[3]**