

2.1: The Tangent and Velocity Problem

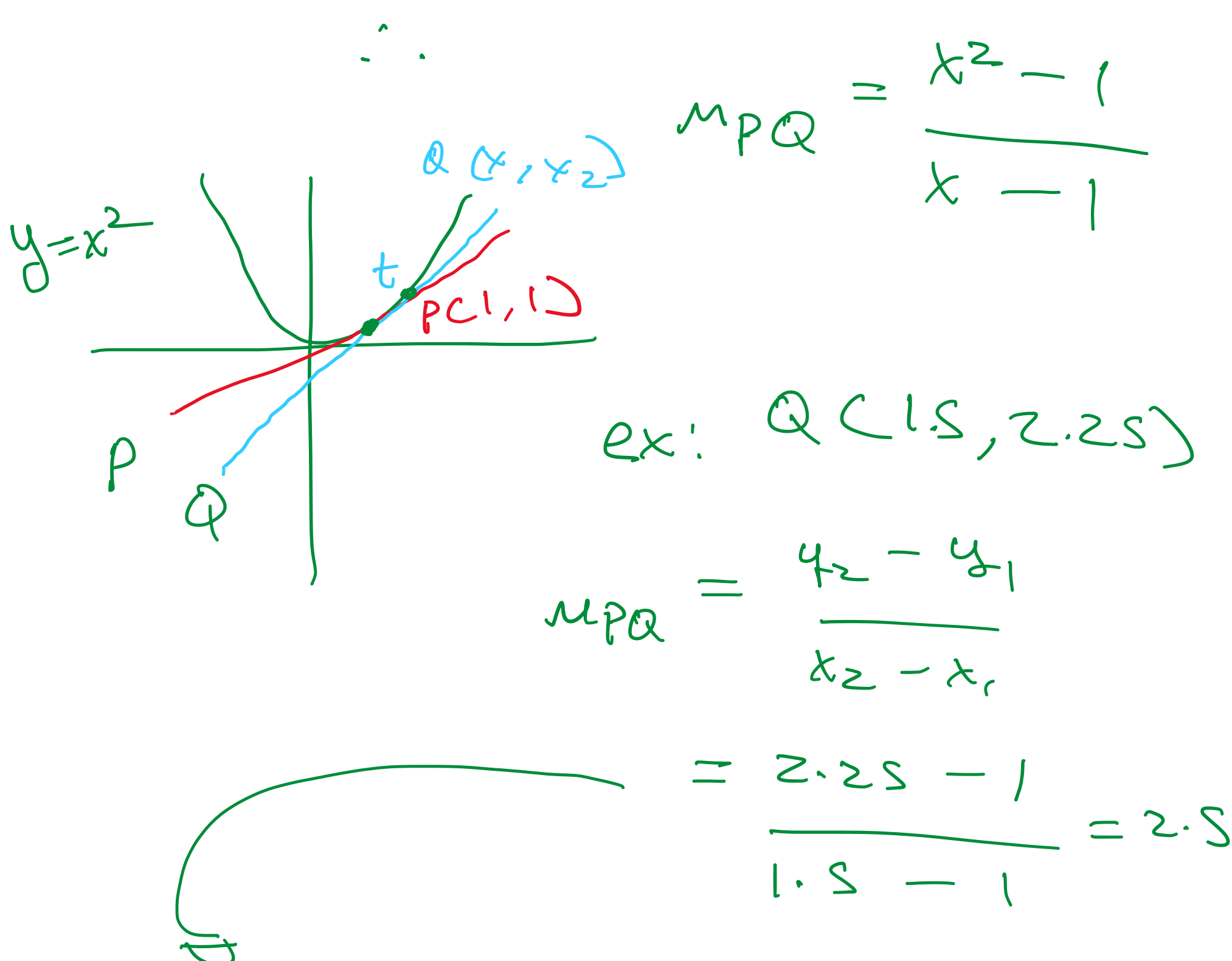
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The Tangent Problem:

- Tangent meaning touching
- for computation, you generally need a secant line as well

↳ the slope of the tangent line at a point on a curve is defined as the limit of the slopes of secant [meaning cutting] lines passing through that point as the two points defining the secant line approach each other



$\lim_{Q \rightarrow P} m_{PQ} = m \quad \& \quad \lim_{x \rightarrow 1} \frac{x^2 - 1}{x - 1} = 2$

↳ the slope of the tangent line is the limit of the slopes of the secant lines

∴

$y - 1 = 2(x - 1)$

equation of the tangent line

The Velocity Problem:

- close connection between the tangent problem & the problem of finding velocities

↳ instantaneous velocity is the limiting value of the avg velocities over shorter & shorter time periods