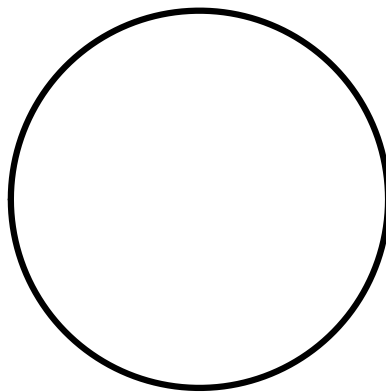


Chapter 1

Functions and Limits

1.4 The Tangent and Velocity Problems

The Tangent problem.

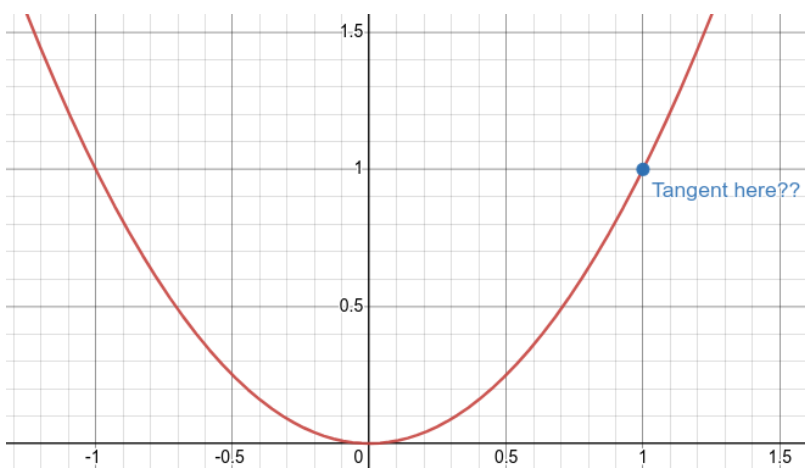


What is the Tangent to a circle

<https://www.desmos.com/calculator/itwxbbdwoe>

In Geometry, a TANGENT LINE at a given point on a curve is a line that brushes against the curve.

EXAMPLE 1 Find an equation of the tangent line to the parabola $y = x^2$ at the point $P(1, 1)$. <https://www.desmos.com/calculator/5eyhh9tfkg>



What is the tangent line?

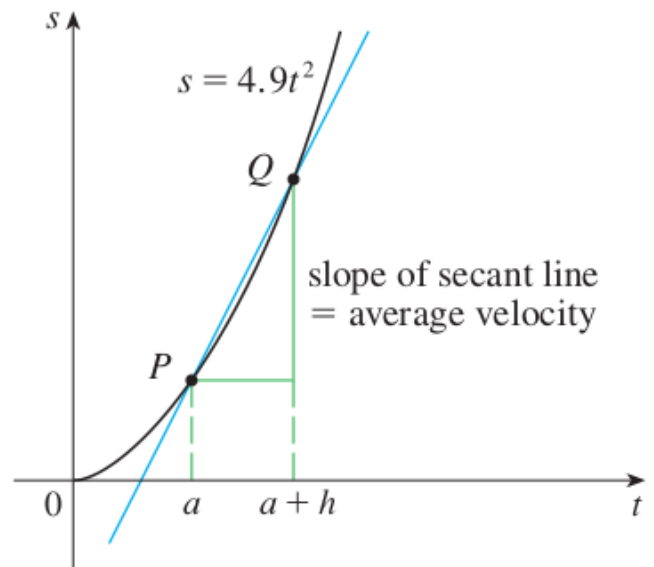
The Velocity Problem.

EXAMPLE 3 Suppose that a ball is dropped from the upper observation deck of the CN Tower in Toronto, 450 m above the ground. Find the velocity of the ball after 5 seconds.

$$\text{Galileo: } s(t) = 4.9t^2$$

Average velocity.

Relation to the secant line.



Instantaneous Velocity.

Relation to the tangent line.

