

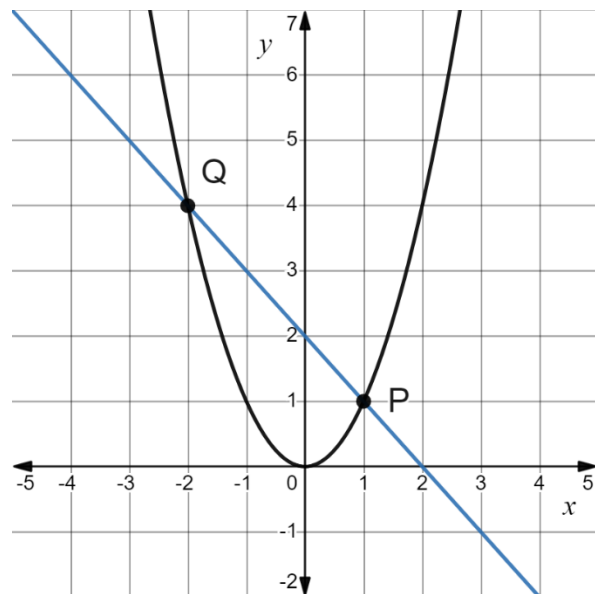
Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Learning Goal 2.1**

Finite limits and continuity.

A **limit** can be used to describe how a function behaves as the independent variable moves towards a certain value. But first,

**The Secant Line**

If we approach P from the right side:

$x$	$m_{PQ}$
2	
1.5	
1.1	
1.01	
1.001	

If we approach P from the left side:

$x$	$m_{PQ}$
0	
0.5	
0.9	
0.99	
0.999	

**The Tangent Line**

**Example** A rock breaks loose from the top of a tall cliff. What is its average speed during the first 2 seconds of fall?

(Note: Experiments show that a dense solid object dropped from rest to fall freely near the surface of the earth will fall  $y = 4.9t^2$  metres in the first  $t$  seconds.)

Find the speed of the rock in at the instant  $t = 2$ .

Numerically

Algebraically

$t$	$m_{PQ}$
1.90	
1.99	
2	—
2.01	
2.10	