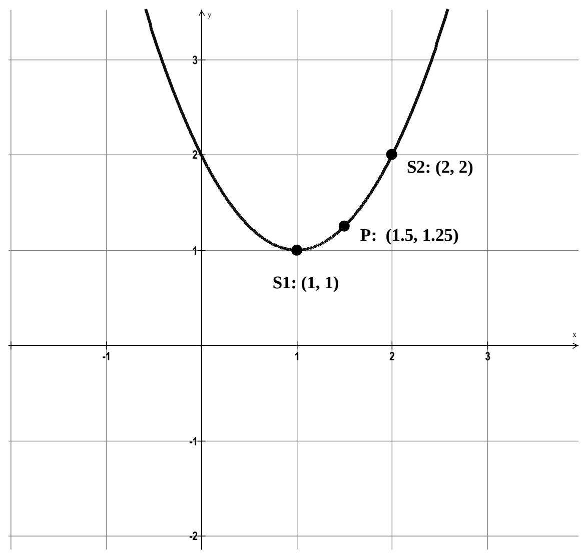
Tangent Line to a Curve

Name________________________________

1. Draw the secant line between P and S_1. Draw the secant line between P and S_2.
   Find the slope between the points marked P and S_1. Find the slope between the points marked P and S_2.
   Find the distance between the **x-coordinates** of S_1 and P and of S_2 and P. (We refer to this difference as h.)

(a)



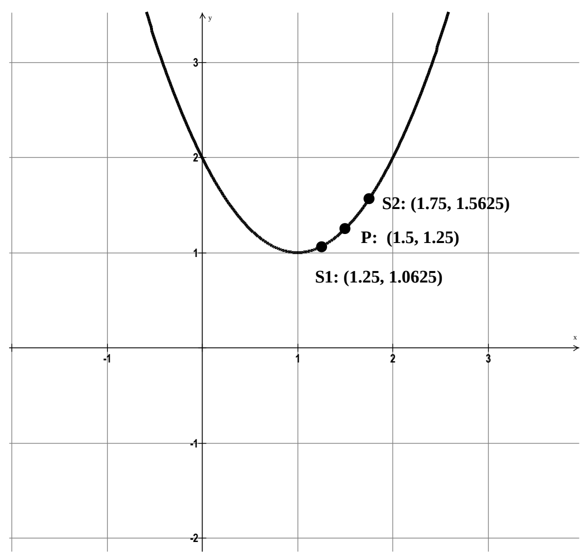
Slope of secant line between P and S_1________

Slope of secant line between P and S_2________

h=_________

Recall the formula for slope (rise over run) $m = \frac{y_2 - y_1}{x_2 - x_1}$

(b)

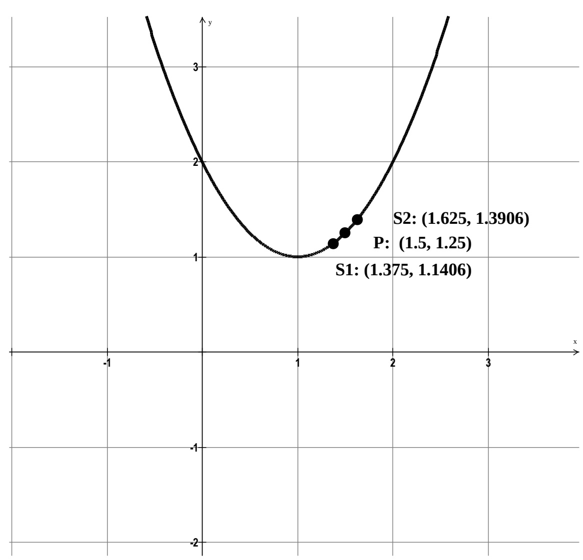


Slope of secant line between P and S_1________

Slope of secant line between P and S_2________

h=_________

(c)



Slope of secant line between P and S_1________

Slope of secant line between P and S_2________

h=_________

Cumulative Questions (for parts a-c)

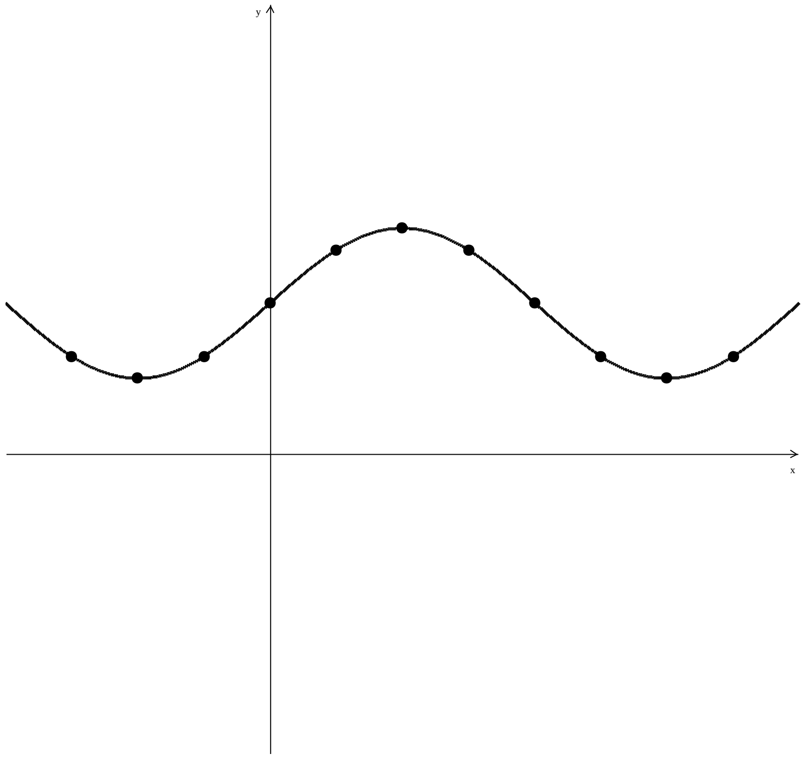
I. What value is the secant slope approaching? ___________

II. What value is h approaching? ___________

III. Draw the tangent line to Point P on graph (c).

IV. Is the slope of the tangent line you drew in part (III) the same as your answer to question (I)? ________

2. Draw a small <u>segment</u> of a line that is tangent to the given curve at each indicated point. (Segments should hug the curve.) Specify whether each slope is positive, negative, or zero by using the symbols $+, -,$ or 0 next to each point.



3. Evaluate $\lim_{h \to 0} \frac{f(x+h) - f(x)}{h}$ for each given function.

(a) $f(x) = 9 - 5x$

(b) $f(x) = 4x^2 - 5x + 9$