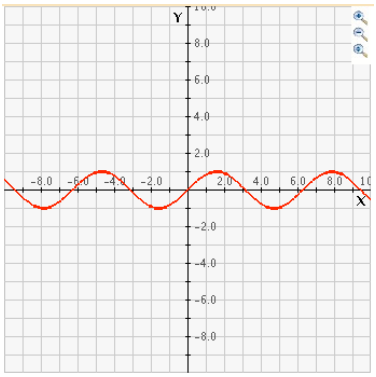
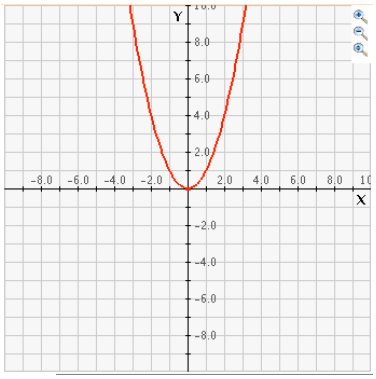
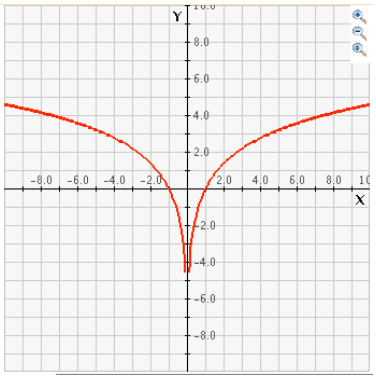
# Derivate Worksheet

1. What does it mean for a function if its derivative at a certain point is negative? What about if the derivative is positive? Zero?

2. For each of the following equations, sketch the tangent lines to the graph at x = -2, x = 0, and x = 2.




3. What is the slope of each of your tangent lines?

Graph 1, x = -2: Slope = _____
Graph 1, x = 0: Slope = _____
Graph 1, x = 2: Slope = _____

Graph 2, x = -2: Slope = _____
Graph 2, x = 0: Slope = _____
Graph 2, x = 2: Slope = _____

Graph 3, x = -2: Slope = _____
Graph 3, x = 0: Slope = _____
Graph 3, x = 2: Slope = _____

4. What do these tell you about the derivatives of the functions at those points?

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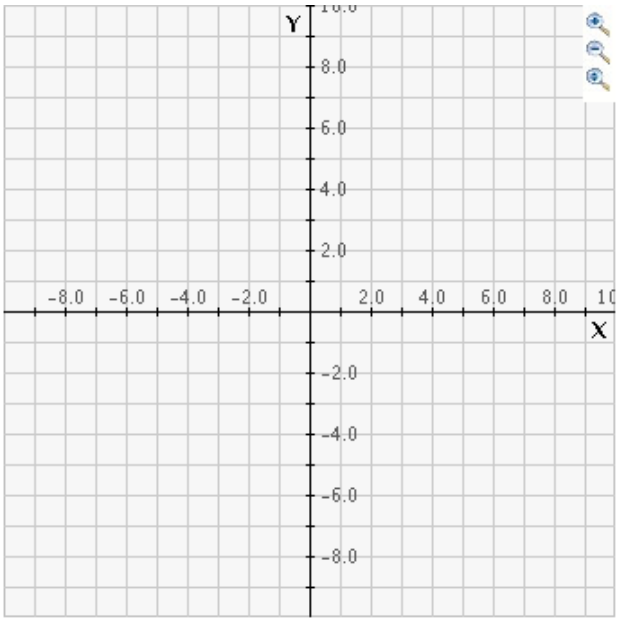
5. Without plotting a tangent line, can you determine whether the derivative of the graph of $x^2$ (the middle graph) is positive or negative at x = 4? How do you know? (hint: is the graph sloping upward or downward?)

6. Using the Derivate applet, input the equation $y = \frac{x^2}{2}$. Find the derivative at the following points and plot them on the graph provided.

x = -5, Derivative = _____
x = -3, Derivative = _____
x = -1, Derivative = _____
x = 0, Derivative = _____
x = 1, Derivative = _____
x = 3, Derivative = _____
x = 5, Derivative = _____




7. Do these points seem to form a graph? If so, what equation might describe the graph?

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