Name: _____ **TC**

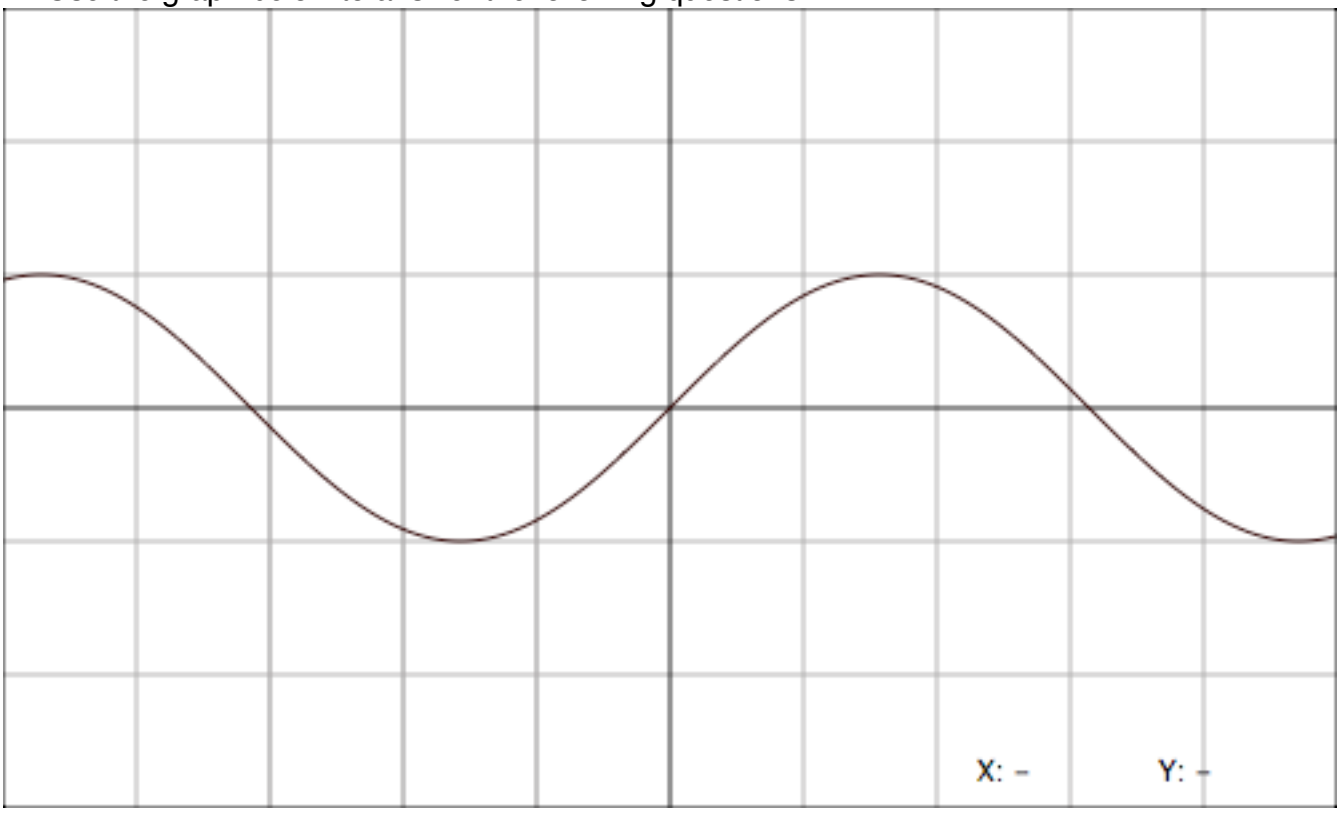
Classwork 52

1. Find the maximum value of each function.

a) $y = \frac{5(x - 1)}{x^3}$

b) $y = \frac{6(x^2 - 5)}{x}$

2. Use the graph below to answer the following questions.



a) What function is this?

b) Label the points on the function where the derivative would equal zero. (A dark dot is sufficient)

c) Draw an up arrow where the derivative seems to be the highest. How high does it look like the derivative gets?

d)Draw a down arrow where the derivative seems to be the most negative. How low does it look like the derivative gets?

f) Use your answers to letters (b) through (e) to **graph the derivative on the same axes.**

g) What do you think the **function** for this derivative might be?

h) How can we use the calculator to see if we might be correct?

i) Graph the **derivative of the derivative** on the same axes. What function might this be?

j) When is the **second derivative** positive?

When is the **second derivative** negative?

What does the **second derivative** tell you about the derivative?

What does the **second derivative** tell you about the *original function*?

3. The graph below shows $y = 1/3x^3 - 3x^2 + 5x - 1$

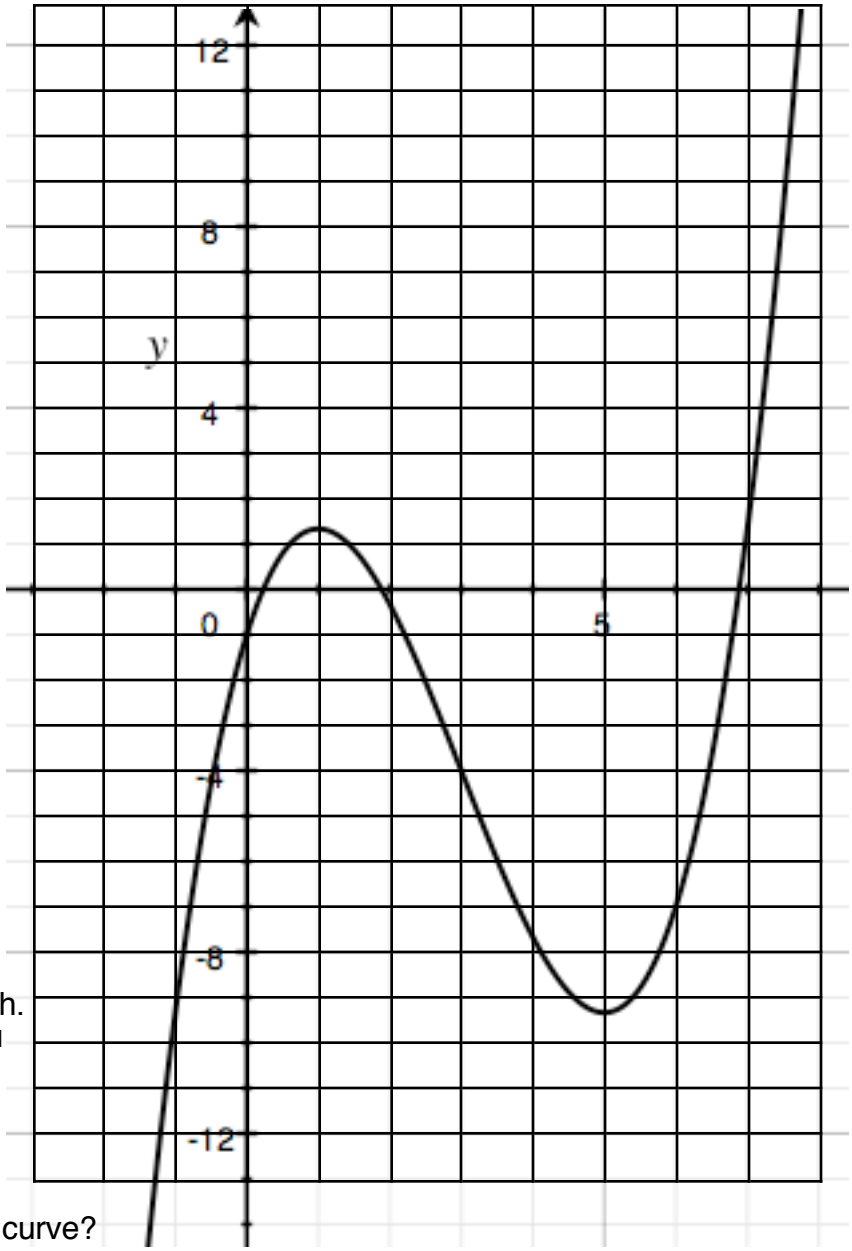
a) When is the derivative of this graph positive? Use the graph to estimate.

b) When is the derivative of this graph negative? Use the graph to estimate.

c) When is the derivative of this graph zero? Use the graph to estimate.

d) What **is** the derivative of this curve?

e) Show that your answers above are correct using the derivative.



f) **Graph** the derivative on this same graph. You should use your calculator to help you get an accurate graph.

g) What is the **second derivative** of this curve?

h) Graph the **second derivative** on the same axes. Use your calculator to get an accurate graph.

i) What does the **second derivative** tell you about the derivative?

about the **original graph???**