Name: _____ **AP**

Classwork 56

1. a) What does the first derivative tell you about a function?

   b) What does it mean when the first derivative is zero?

   c) What does the second derivative tell you about a function?

   d) What does it mean when the second derivative is zero?

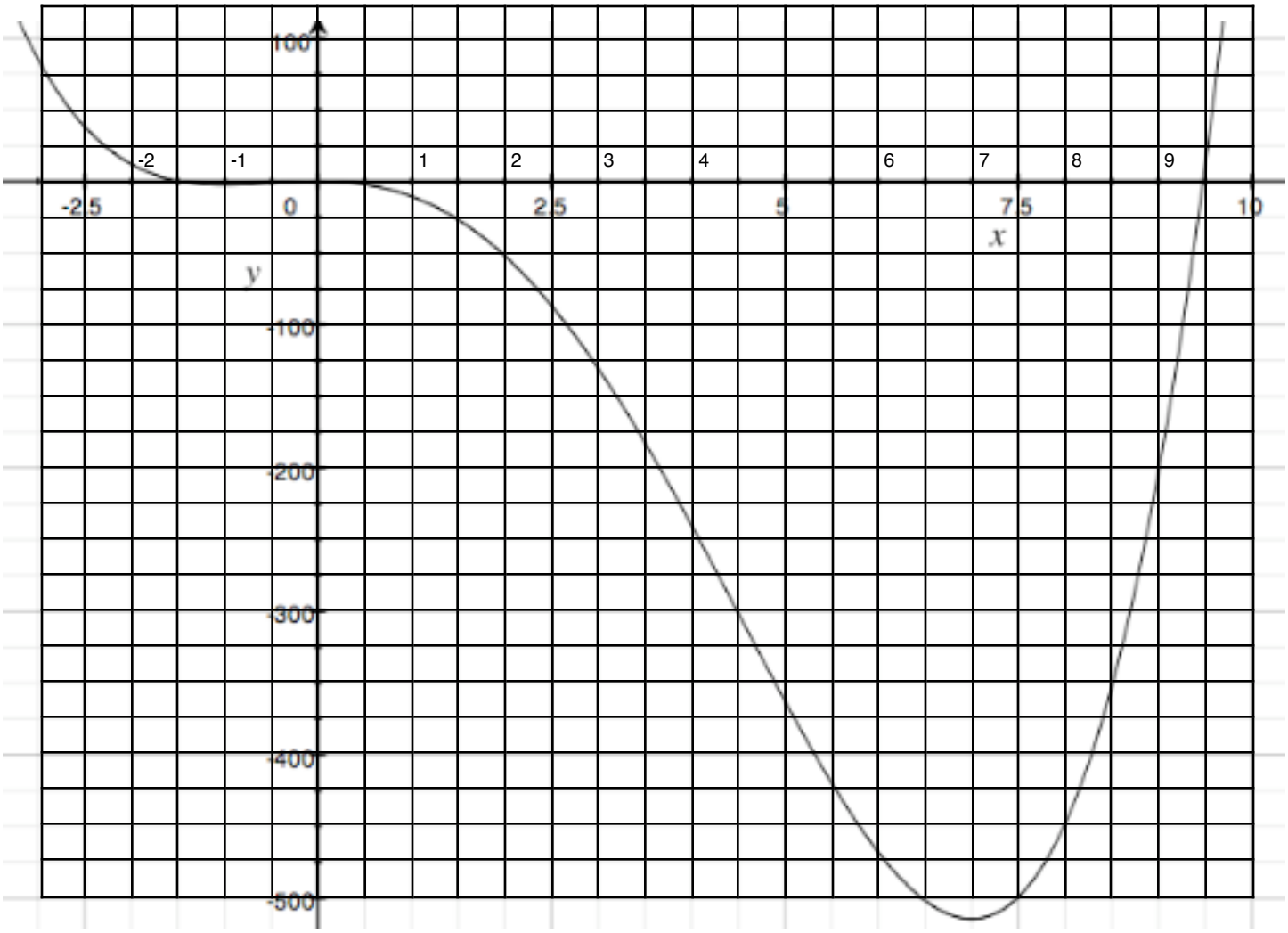
2. a) Sketch a graph of the function $y = x^4 - x^2$

   b) When is the function negative?

   c) What are the maxima and minima of the function?

   d) Where does the curvature change?

3. The graph below shows $f(x) = 1/2x^4 - 4x^3 - 7x^2$.



a) When is the ***function*** equal to zero? Use algebra and then the calculator.

b) Where are the maxima and minima? Use calculus and then check your answer with the calculator.

c) Where are the inflection points? Use calculus and then check your answer with the calculator.

4. Let's say we graph distance on the y-axis and time on the x-axis.

a) What does f(x) tell you?

b) What does f'(x) tell you?

c) What does f''(x) tell you?

5. An object is moving according to the formula $y = 6/t^2 + 5t^2$ where y represents distance in meters and t represents time in seconds.

a) Find the object's position at t = 4.

b) Find the object's speed at t = 4.

c) Find the object's acceleration at t = 4.

d) When is the object's displacement at a maximum?

e) When is the object's speed at a maximum?

f) Why does this make sense in terms of calculus?