

Math 1743 - Math Center Worksheet Section 4.2

1. For $f(x) = -0.1x^3 - 16.92x^2 - 940.416x - 16,091.3$, answer the following :

Round answers to the hundredths place if necessary.

a. Find any critical inputs for $f(x)$. Show the equation you are solving.

b. Use the graph (but you don't need to sketch it) to classify each critical point as a relative maximum or relative minimum. State your critical points as ordered pairs.

2. Based on the information given, fill in the blank with the **most appropriate** word or phrase from the following list (choose only one):

positive, negative, zero, increasing, decreasing, horizontal tangent line,
concave up, concave down, relative maximum, relative minimum,
relative extremum, inflection point, does not exist, nothing

a. If $j''(0) = 375$,
what must be true about the graph of $j(x)$ at $x = 0$? _____.

b. If the graph of $t'(x)$ crosses the x -axis at $x = -2.5$,
what must be true about the graph of $t(x)$ at $x = -2.5$? _____.

c. If $h''(16) = 0$,
what must be true about the graph of $h'(x)$ at $x = 16$? _____.

Math 1743 - Math Center Worksheet

Section 4.3

Sales in the multimedia market (hardware and software) are approximated by:

$S(x) = -0.009x^4 + 0.121x^3 - 0.087x^2 + 0.020x + 3.334$ billion dollars, x years after 1990.

Fill in the following, rounding to the hundredths place and including units with the first fill-in on each part.

The absolute **maximum** sales between 1995 and 2001

is _____ and takes place _____ years after 1990.

The absolute **minimum** sales between 1995 and 2001

is _____ and takes place _____ years after 1990.

Math 1743 - Math Center Worksheet Section 4.4

1. Find the second derivatives of the following functions:
You do not need to simplify your answers.

a. $y = 32x^6 - 14x$

b. $y = 2e^{9x}$

2. A group commissioned by the provost of a growing university estimates that the enrollment can be modeled by the following:

$$s(t) = \frac{50.751}{1 + 1.615e^{-0.097t}} \text{ thousand students enrolled, } t \text{ years since 1995.}$$

- a. Find the inflection point of $s(t)$ on $[0, 15]$.
- b. Write a sentence of interpretation for this inflection point.