Applications of the First Derivative.

1. Find the interval where the function is increasing and the interval where it is decreasing.

$f(x) = 2x^2 + 4x + 2$

2. Find the intervals where the function is increasing and the intervals where it is decreasing.

$f(x) = 1/4x^4 - 1/2x^2 + 2$

3. Find the interval where the function is increasing and the intervals where it is decreasing.

$f(x) = 1/(x - 2)$

4. Find the $x - values$ of the relative maxima and relative minima of the function below.

$g(x) = (1/2)x^2 - 2x + 3$

5. Find the $x - values$ of the relative maxima and relative minima of the function below.

$f(x) = 25/4x^4 - 100/3x^3 + 1$

6. A certain company manufactures an indoor-outdoor thermometer. Management estimates that the profit (in dollars) realizable by the company for the manufacture and sale of $x - units$ of thermometers each week is represented by the function below, where $x \geq 0$. Find the interval where the profit function P is increasing and the interval where P is decreasing.

$P(x) = -0.001x^2 + 4x - 5000$