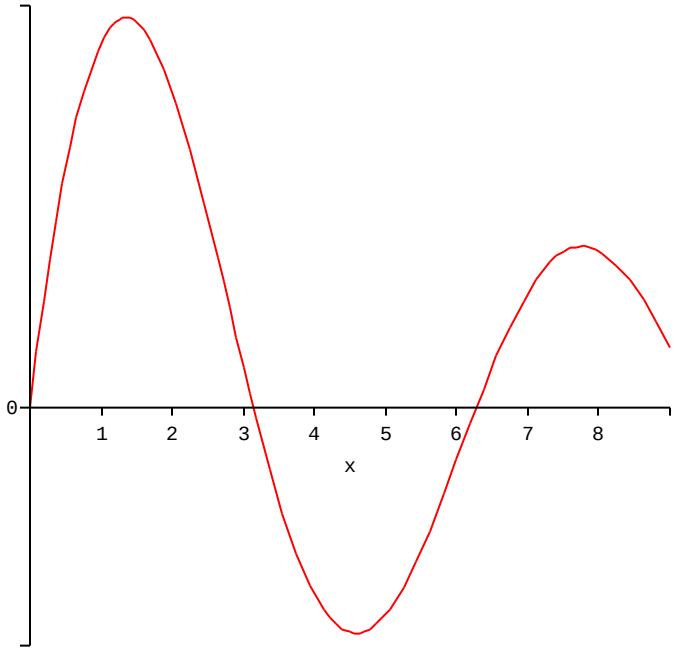
Let $F(x) = \int_1^x f(t)\ dt$ where $f(t)$ is the function graphed below.




1. Where is $F$ increasing? decreasing?
2. Where does $F$ have a local max? a local min?
3. Is $F$ concave up or concave down at $x = 3$?
4. Determine if the following values are positive or negative:

$$F(3) \qquad F(4) \qquad F(0) \qquad F(1)$$

1. Suppose the marginal revenue when $x$ thousand units of a particular good are produced is $R'(x) = 10,000x^{\frac{4}{5}}$ dollars and 1000 units are currently produced.

   How much additional revenue will be generated by producing 4000 units?

2. Suppose that when a particular industrial machine is $t$ years old, it generates revenue at a rate of

$$R'(t) = 5000 - 20t^2 \text{ dollars per year}$$

   and that operating and servicing costs related to the machine accumulate at a rate of

$$C'(t) = 2000 + 10t^2 \text{ dollars per year}$$

   (a) How many years pass before the profitability of the machine begins to decline?
   (b) Compute the net earnings generated by the machine over the time determined in part (a).