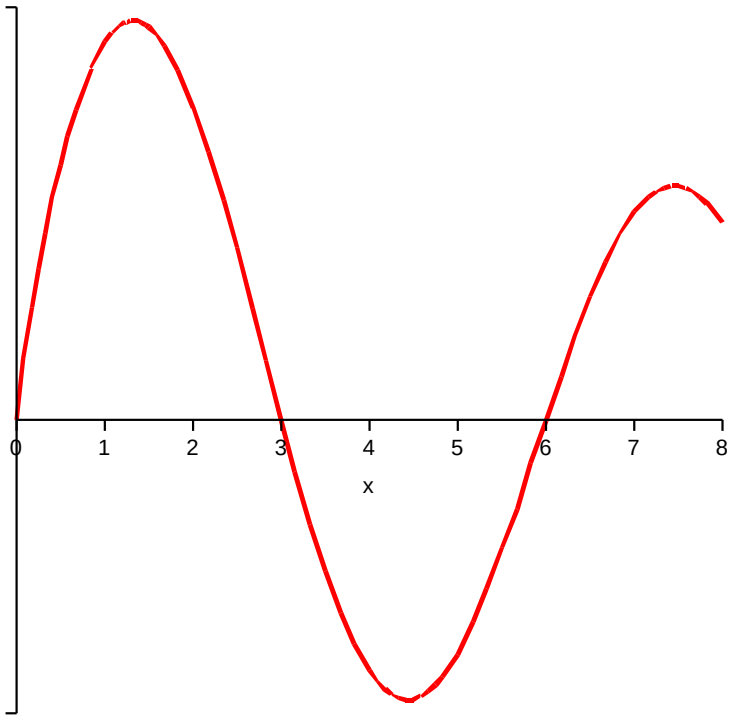
Let $F(x) = \int_1^x f(t)\,dt$ where $f(t)$ is the function graphed below.

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:

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



Evaluate the following integrals

1. $\int_0^{\pi/2} \sin(3x)\ dx$

2. $\int_1^4 x^3 - e^x - 2\ dx$

3. $\int_1^3 3x^2 \ln(x) + x^3 \left(\frac{1}{x}\right)\ dx$

4. $\int_0^5 2x \sin(x^2)\ dx$

5. $\int_0^5 \sin(x^2)\ dx$