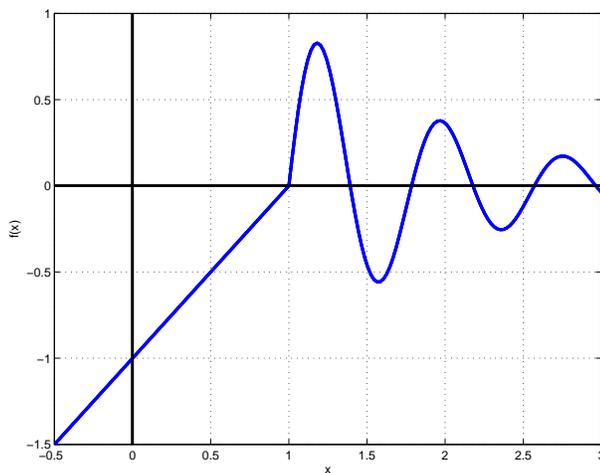


MA205 - Integral Calculus
Homework Assignment 2
Due In Class Friday, September 14

- If $f(1) = 8$ and $f(2) = 4$, what is $\int_1^2 2f'(x) + 3e^x dx$?
- Below is a graph of the function $f(x)$. Let $G(\theta) = \int_1^\theta f(x) dx$. Calculate $G(0)$ and $G'(0)$, and explain how you arrive at your answer.



- Suppose $\int_3^5 f(x) dx = 2$ and $\int_3^5 g(x) dx = -3$. What is $\int_3^5 3f(x) - 4g(x) dx$?
- Suppose the acceleration of a particle is given by $a(t) = e^{-t} + t^2$ in $\frac{ft}{s^2}$ and that at $t = 3$ the particle is traveling at $21 \frac{ft}{s}$. Find a velocity function for the particle at any time t .
- Evaluate the following integrals.

<p>(a) $\int_4^6 \frac{1 + \sqrt[3]{x}}{x^4} dx$</p> <p>(b) $\int_0^1 (t^2 + 1) \sin(t^3 + 3t) dt$</p> <p>(c) $\int \frac{5e^x + 1}{e^x} dx$</p>	<p>(d) $\int \cos(x)e^{-4\sin(x)} dx$</p> <p>(e) $\int e^t + \frac{1}{t} dt$</p> <p>(f) $\int_1^\pi e^{\theta y} dy$</p>
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- Calculate: $\frac{d}{dx} \left(\int_{-1}^x \frac{e^{\tan(t)}}{1+t^2}, dt \right)$.
- The velocity function (in meters per second) for a particle traveling in a straight line is given by $v(t) = -t^2 + 2t$.
 - Find the *displacement* of the particle from $t = 1$ to $t = 3$ seconds.
 - Find the *distance traveled* by the particle over the same time period.
- What is the length of one cycle of the curve $y = \sin(x)$?