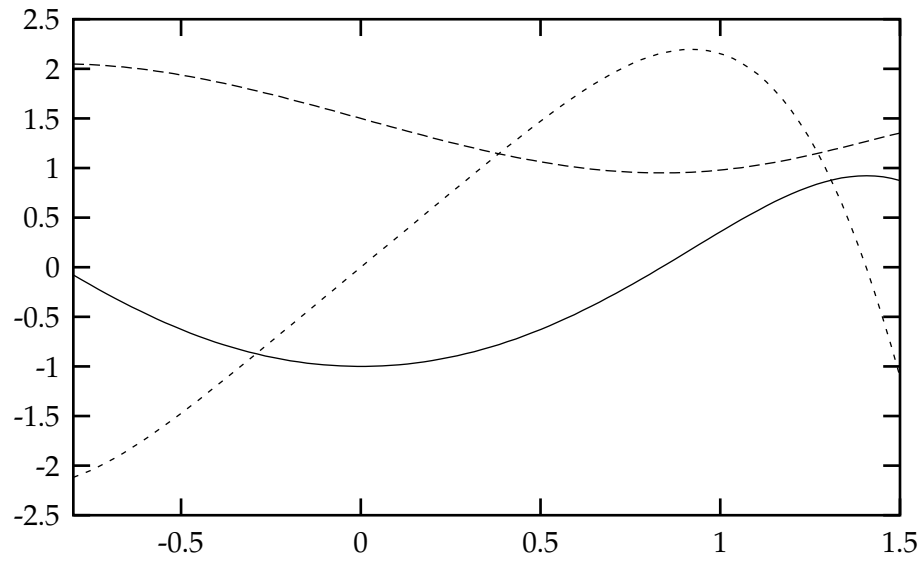


Problem 1. [10 points] Below, the graphs of f , f' , and f'' are sketched. Which are which? Label clearly.



Problem 2. [20 points] Suppose that oil is leaking from a ruptured tanker at a rate of 100 cubic meters per hour and is creating a circular oil slick 0.02 meters deep. How fast is the radius of the spill growing when the radius is 1000 meters? (The volume of a circular cylinder of thickness h and radius r is $V = \pi r^2 h$.)

Problem 3. [2 points each] True or False.

(a) $\frac{d}{dx} \sqrt{f(x)} = \frac{f'(x)}{2\sqrt{f(x)}}.$

(b) $\frac{d}{dx} (f(x)g(x)) = f'(x)g'(x).$

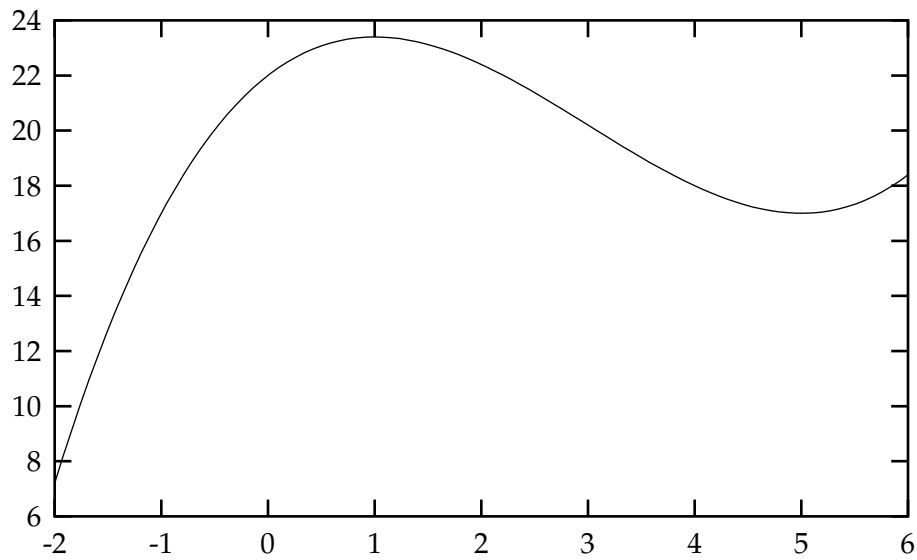
(c) If f is differentiable at x then f is continuous at x .

(d) If f is continuous at x then f is differentiable at x .

(e) $\frac{d}{dx} f^{-1}(x) = \frac{1}{f'(f^{-1}(x))}.$

Problem 4. [20 points] Estimate the number $\sqrt[3]{65}$ using a tangent line approximation.

Problem 5. The graph of a derivative $y = f'(x)$ is sketched below.



Use the picture to answer the following questions about the function f .

(a) [10 points] On which interval is f concave down?

(b) [10 points] Circle one:

$f(2) > f(3)$

$f(2) < f(3)$

there's not enough information given to say which

Problem 6. [20 points] Consider the curve defined by $y^3 + xy + e^{y-1} = 7$. Find the equation of the tangent line to this curve at $(5, 1)$.

EXAM

Midterm 2

Math 131

Monday, November 10, 2003

- Name
- Student ID
- Lecture Section
- Recitation Section

1	/10
2	/20
3	/10
4	/20
5	/20
6	/20
total	/100

Success!