

NAME \_\_\_\_\_

1. Find the derivative of the following
  - (a)  $f(x) = \frac{x-2}{\sqrt{x^2+1}}$  when  $x = 1$ .
  - (b)  $y = \sec(\sec x)$  when  $x = \pi/4$ .
  - (c)  $y = e^{3x-4x^2} \ln ex$  when  $x = 1$ .
2. The volume of a cube is increasing at a rate of 3 centimeters per minute. How fast is the surface area increasing when the edge length is 7 centimeters?
3. An isosceles triangle has two sides of length 1 meter. Suppose that the angle between the two equal sides is increasing at a rate of 3 radians per minute. At what rate is the area of the triangle changing when the included angle is  $45^\circ$ ?
4. If it is known that
$$f'(3x - 2) = x^2 + 1,$$
find  $f'(x)$ .
5. The altitude of a triangle is increasing at a rate of 1 cm/min while the area of the triangle is increasing at a rate of 2 cm<sup>2</sup>/min. At what rate is the base of the triangle changing when the altitude is 10 cm and the area is 100 cm<sup>2</sup>/min?