

**Math 124 Worksheet #3**  
**April 20, 2007**

1. The following limit represents the derivative of some function  $f(x)$  at some number  $a$ . What is  $f(x)$  and  $a$ ?

$$\lim_{h \rightarrow 0} \frac{\frac{1}{(2+h)^2} - \frac{1}{4}}{h}$$

2. Suppose  $v = g(t)$  gives the velocity (in meters/second) of a(n) \_\_\_\_\_ at  $t$  seconds as it travels along a straight line.

(a) What is the meaning of the derivative  $g'(t) = \frac{dv}{dt}$ ? What are the units of the derivative?

(b) Interpret the statement  $\left. \frac{dv}{dt} \right|_{t=10} = 6$ .

3. For  $y = \frac{1}{\sqrt{3x}}$ , find  $\frac{dy}{dx}$  using limits.

4. The function  $h(x)$  is given below. For what values of  $x$  is  $h(x)$  differentiable? Sketch  $h'(x)$ .

