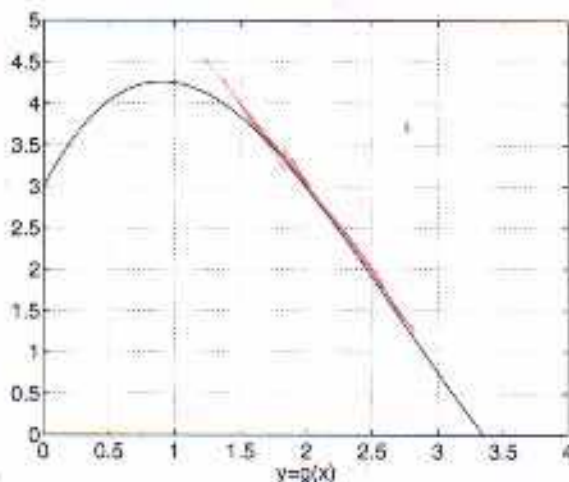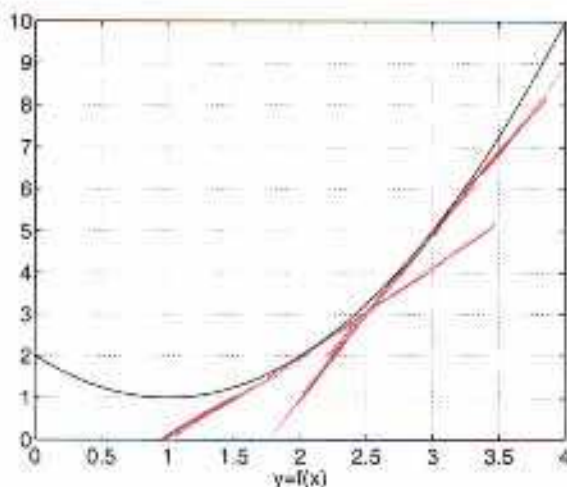**7.** (10 points) Let f and g be functions with the following graphs.

y=f(x)   y=g(x)

Use the graphs to estimate each of the following derivatives. Show your work and circle your answers.

(a) $h'(2)$ if $h(x) = f(x)g(x)$

$$h'(x) = f(x) \cdot g'(x) + f'(x) \cdot g(x)$$

$$h'(2) = 2(-2) + 2(3) = \boxed{2}$$

$f(2) = 2$

$f'(2) \approx 2$

$g(2) = 3$

$g'(2) \approx -\frac{1}{\frac{1}{2}} = -2$

(b) $h'(2)$ if $h(x) = \frac{f(x)}{g(x)}$

$$h'(x) = \frac{g(x) \cdot f'(x) - f(x) \cdot g'(x)}{(g(x))^2}$$

$$h'(2) = \frac{3(2) - 2(-2)}{(3)^2} = \boxed{\frac{10}{9}}$$

(c) $h'(2)$ if $h(x) = f(g(x))$

$$h'(x) = f'(g(x)) \cdot g'(x)$$

$$h'(2) = f'(3) \cdot g'(2)$$

$$= 4(-2) = \boxed{-8}$$

$g(2) = 3$

$f'(3) \approx \frac{2}{\frac{1}{2}} = 4$