

## Practice Problems — 01/28/05

(1) Let  $f(x) = \sqrt{x}$ .

(a) Find the equation for the line tangent to  $f$  at the point  $(4, 2)$ .

(b) Use this line to approximate the values of  $f(4.01)$  and  $f(4.1)$ . Which is likely a better approximation?

(2) Let  $f(x) = \sin(x)$ .

(a) Use the graph of  $f$  to determine  $f'(\frac{\pi}{2})$ , then give the equation of the tangent line to  $f$  at  $(\frac{\pi}{2}, 1)$ .

(b) Use the previous result to approximate the value of  $\sin(\frac{\pi}{2} + \varepsilon)$ , where  $\varepsilon$  is an arbitrary real number. Is this approximation better for small  $\varepsilon$  or large values of  $\varepsilon$ ?