

1. (12 points) Find the derivative of each of the following:

a.  $f(x) = x\sqrt{x} + \frac{2}{x^3}$

b.  $f(x) = (x^2 + 4)\cos x$

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

d.  $f(x) = \frac{2x+3}{2x-3}$

2. (8 points) Find an equation of the tangent line to the curve  $y = x \sin x$  at  $x = \frac{\pi}{2}$ .