2.7 Worksheet: Chain Rule/Implicit Differentiation Worksheet

1. Use the chain rule (and other rules) to find the derivatives of the following functions:

   a. $f(x) = \sin(3x)e^{x^3}$

   b. $f(x) = \tan(2x + 3) * e^{3x}$

   c. $f(x) = \frac{\sqrt{2x+1}}{\cos(2x)}$

2. Use implicit differentiation to find y' for the following:

   a. $x^2y^2 = x + 2$

   b. $\sin(xy) = x + y$

3. We know that f(x)$\frac{1}{f(x)} = 1$; use implicit differentiation to find the derivative of $f(x)^{-1} = \frac{1}{f(x)}$.

4. Carry out Activity 2.7.4, from our textbook:

Activity 2.7.4. For each of the following curves, use implicit differentiation to find dy/dx and determine the equation of the tangent line at the given point.

a. $x^3 - y^3 = 6xy,\ (-3, 3)$

b. $\sin(y) + y = x^3 + x,\ (0, 0)$

c. $3xe^{-xy} = y^2,\ (0.619061, 1)$