1. Given that
\[ f(1) = 2 \quad g(1) = 3 \quad f'(1) = \sqrt{2} \quad g'(1) = e^2 \]
\[ f(2) = -1 \quad g(2) = \pi \quad f'(2) = \sin 2 \quad g'(2) = 7 \]
compute the following derivatives (you do not have to simplify your answers):

a. \( j'(1) \) where \( j(x) = g(f(x)) \).

b. \( h'(1) \) where \( h(x) = f(x)g(x) \).

c. \( k'(1) \) where \( k(x) = g(x)/f(x) \).

2. Let \( u(x) = x^2 - 4x + 4 \) and \( v(x) = \sin(x) \).

a. What is the formula for \( u(v(x)) \)?

b. What is the formula for \( v(u(x)) \)?
3. Find the derivatives of each of the following:

a. \( f(x) = \sin x \cos x \)

b. \( g(t) = \frac{\tan t}{t^2} \)

c. \( h(z) = \cos^3 z \)

d. \( j(w) = \cos(w^3) \)

e. \( v(t) = 2^{\sin t} \)