

Name: _____

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Instructor: Bueler | Jurkowski | Maxwell

There are 25 points possible on this quiz. No aids (book, calculator, etc.) are permitted. Show all work for full credit.

1. [16 points] Compute the derivatives of the following functions. You need not simplify your answers.

a. $r(\theta) = \theta \sec(\theta) \tan(\theta)$

b. $g(t) = e^{t^2} \sec(t)$

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

d. $s(t) = \tan\left(e^{\sin(t)}\right)$

2. [5 points]

a. Find the first four derivatives of $y = \cos(4x)$.

b. Using part (a), determine the 49th derivative of $y = \cos(4x)$.

3. [4 points] Consider the function $f(t) = t - \cos t$.

a. Find all t values for which $f(t)$ has a horizontal tangent line.

b. Suppose $f(t)$ represents the position in feet of some particle at time t seconds. Find the velocity of the particle at time $t = \frac{\pi}{2}$.