

NAME \_\_\_\_\_ DATE \_\_\_\_\_ PER \_\_\_\_\_ SCORE \_\_\_\_\_

**Power Rule****Derivatives:** *Differentiate.*

1)  $f(x) = e^x + \frac{3}{x^2}$

2)  $g(x) = 5\sqrt[3]{x} - \frac{4}{\sqrt[4]{x}} + 5e^x$

**Rates of Change:** *Find the instantaneous rate of change at the given value.*

3)  $f(x) = 3x^3 - \frac{x}{2}$  at  $a = -2$

4)  $y = 3x^2 - 2\sqrt{x} + e^x$  at  $a = 4$

**Tangent Lines:** *Find the equation of the tangent line.*

5)  $f(x) = \sqrt{x} - x^2$  at  $x = 4$

6)  $f(x) = \frac{1}{x} - x$  at  $x = -3$

**Evaluating Trig. Functions:** Find the exact value without the use of a calculator.

7)  $\sin \frac{7\pi}{6}$

8)  $\csc \frac{5\pi}{3}$

9)  $\sec \left( -\frac{5\pi}{4} \right)$

10)  $\cot \frac{\pi}{2}$

11)  $\cos(-120^\circ)$

12)  $\tan \frac{3\pi}{2}$

**Factoring Expressions:** Factor. Leave answers in positive exponents.

13)  $20x^{-3/8} - 15x^{5/8}$

14)  $-17x^{9/5} - 22x^{-11/5}$