Homework 3.1 – Power Functions

1. **(1 pt) alfredLibrary/AUCI/chapter3/lesson1/rationalexponent1pet.pg**

(a) Rewrite $f(x)$ as a power function, and then find its derivative using the power rule.

$f(x) = -5 \cdot \sqrt[9]{x^{19}} =$ ___ x ___

$\frac{df}{dx} =$ ___ x ___

(b) Rewrite $g(x)$ as a power function, and then find its derivative using the power rule.

$g(x) = -4 \cdot \sqrt[2]{x^{16}} =$ ___ x ___

$\frac{dg}{dx} =$ ___ x ___

2. **(1 pt) alfredLibrary/AUCI/chapter3/lesson1/quiz/power3pet.pg**

Compute the following derivatives.

(a) $\frac{d}{dx}(x^{9/6}) =$ ______

(b) $\frac{d}{dx}(x^{-8/9}) =$ ______

3. **(1 pt) alfredLibrary/AUCI/chapter3/lesson1/power7pet.pg**

(a) If $f(r) = \frac{5}{9r^3} + \frac{5}{7r^5}$, then $f'(3) =$ ______.

(b) If $g(t) = 7t^{3/5} - 8t^{3/7}$, then $g'(1) =$ ______.

4. **(1 pt) alfredLibrary/AUCI/chapter3/lesson1/power9pet.pg**

(a) If $f(x) = 4 + \frac{5}{x} + \frac{6}{x^2}$, then $f'(x) =$ ______.

(b) If $g(x) = 3x^4\sqrt{x} + \frac{-4}{x^2\sqrt{x}}$, then $g\,'(x) =$ ______.

5. **(1 pt) alfredLibrary/AUCI/chapter3/lesson1/power21pet.pg**

The function $f(x) = 9x + 3x^{-1}$ has one local minimum and one local maximum. (To visualize this, graph f on the interval $[-9/3, 9/3]$.)

(a) The function has a local minimum at $x =$ ______. The local minimum is ______.

(b) The function has a local maximum at $x =$ ______. The local maximum is ______.