

SOLUTIONS M119 Supplement Section 2.2 Renaming and taking derivatives

Rules for exponents: $\frac{c}{x^n} = cx^{-n}$ $\sqrt[n]{x^m} = x^{m/n}$ $\frac{c}{\sqrt[n]{x^m}} = cx^{-m/n}$

	$f(x)$	Rename using rules for exponents	Use Power Rule to find $f'(x)$	Simplify using rules for exponents
1.	$f(x) = \sqrt[7]{x^2}$	$f(x) = x^{2/7}$	$f'(x) = \frac{2}{7}x^{-5/7}$	$f'(x) = \frac{2}{7\sqrt[7]{x^5}}$
2.	$f(x) = \frac{4}{\sqrt{x}}$	$f(x) = 4x^{-1/2}$	$f'(x) = -2x^{-3/2}$	$f'(x) = \frac{-2}{\sqrt{x^3}}$
3.	$f(x) = \frac{1}{x^7}$	$f(x) = x^{-7}$	$f'(x) = -7x^{-8}$	$f'(x) = \frac{-7}{x^8}$
4.	$f(x) = \sqrt{x}$	$f(x) = x^{1/2}$	$f'(x) = \frac{1}{2}x^{-1/2}$	$f'(x) = \frac{1}{2\sqrt{x}}$
5.	$f(x) = \frac{6}{x^4}$	$f(x) = 6x^{-4}$	$f'(x) = -24x^{-5}$	$f'(x) = \frac{-24}{x^5}$
6.	$f(x) = \frac{7}{\sqrt[6]{x}}$	$f(x) = 7x^{-1/6}$	$f'(x) = -\frac{7}{6}x^{-7/6}$	$f'(x) = -\frac{7}{6\sqrt[6]{x^7}}$
7.	$f(x) = \frac{-4}{x^3}$	$f(x) = -4x^{-3}$	$f'(x) = 12x^{-4}$	$f'(x) = \frac{12}{x^4}$
8.	$f(x) = 72\sqrt[5]{x^2}$	$f(x) = 72x^{2/5}$	$f'(x) = \frac{144}{5}x^{-3/5}$	$f'(x) = \frac{144}{5\sqrt[5]{x^3}}$
9.	$f(x) = \frac{2x^3 + 4x^2}{2x^7}$	$f(x) = x^{-4} + 2x^{-5}$	$f'(x) = -4x^{-5} - 10x^{-6}$	$f'(x) = \frac{-4}{x^5} - \frac{10}{x^6}$
10.	$f(x) = \frac{2}{3x}$	$f(x) = \frac{2}{3}x^{-1}$	$f'(x) = -\frac{2}{3}x^{-2}$	$f'(x) = -\frac{2}{3x^2}$
11.	$f(x) = \frac{x}{4}$	$f(x) = \frac{1}{4}x$	$f'(x) = \frac{1}{4}$	$f'(x) = \frac{1}{4}$