

### Differentiation the Easy Way

Differentiate each function. Rewrite it first in the form  $y = ax^n$ . Then use the constant multiple and power rules to differentiate. Finally, simplify your answer, if possible.

*Do not use the product, quotient, or chain rules for any of these.*

	function	function rewritten	derivative	derivative simplified
1	$y = x^2 \cdot x^{10}$	=	$\frac{dy}{dx} =$	=
2	$y = x^5 \cdot x^{20}$	=	$\frac{dy}{dx} =$	=
3	$y = \frac{x^3}{x^5}$	=	$\frac{dy}{dx} =$	=
4	$y = \frac{x^7}{x^{10}}$	=	$\frac{dy}{dx} =$	=
5	$y = \frac{x}{5}$	=	$\frac{dy}{dx} =$	=
6	$y = \frac{x}{12}$	=	$\frac{dy}{dx} =$	=
7	$y = \frac{5}{x}$	=	$\frac{dy}{dx} =$	=
8	$y = \frac{12}{x}$	=	$\frac{dy}{dx} =$	=
9	$y = \frac{1}{5x}$	=	$\frac{dy}{dx} =$	=
10	$y = \frac{1}{12x}$	=	$\frac{dy}{dx} =$	=
11	$y = \frac{x^2}{3}$	=	$\frac{dy}{dx} =$	=
12	$y = \frac{x^3}{7}$	=	$\frac{dy}{dx} =$	=
13	$y = \frac{3}{x^2}$	=	$\frac{dy}{dx} =$	=
14	$y = \frac{7}{x^3}$	=	$\frac{dy}{dx} =$	=
15	$y = \frac{1}{3x^2}$	=	$\frac{dy}{dx} =$	=

	function	function rewritten	derivative	derivative simplified
16	$y = \frac{1}{7x^3}$	=	$\frac{dy}{dx} =$	=
17	$y = \sqrt{x^3}$	=	$\frac{dy}{dx} =$	=
18	$y = \sqrt{x^5}$	=	$\frac{dy}{dx} =$	=
19	$y = 5\sqrt[3]{x}$	=	$\frac{dy}{dx} =$	=
20	$y = 10\sqrt[5]{x}$	=	$\frac{dy}{dx} =$	=
21	$y = \sqrt[5]{x^3}$	=	$\frac{dy}{dx} =$	=
22	$y = \sqrt[4]{x^5}$	=	$\frac{dy}{dx} =$	=
23	$y = \frac{1}{\sqrt[5]{x^3}}$	=	$\frac{dy}{dx} =$	=
24	$y = \frac{1}{\sqrt[4]{x^5}}$	=	$\frac{dy}{dx} =$	=
25	$y = x\sqrt[4]{x^3}$	=	$\frac{dy}{dx} =$	=
26	$y = x\sqrt[3]{x^2}$	=	$\frac{dy}{dx} =$	=
27	$y = x^3\sqrt{x}$	=	$\frac{dy}{dx} =$	=
28	$y = x^7\sqrt[3]{x^2}$	=	$\frac{dy}{dx} =$	=
29	$y = \frac{1}{x^2\sqrt[5]{x^3}}$	=	$\frac{dy}{dx} =$	=
30	$y = \frac{1}{x^3\sqrt[3]{x^2}}$	=	$\frac{dy}{dx} =$	=
31	$y = \frac{2}{5x^2\sqrt[5]{x^4}}$	=	$\frac{dy}{dx} =$	=
32	$y = \frac{8}{11x^5\sqrt[4]{x^3}}$	=	$\frac{dy}{dx} =$	=