

More problems for section 2.7 of *Calculus, Early Transcendentals* by James Stewart, 8e.

1. Use the definition of the derivative [4](#) or its equivalent form [5](#) (in section 2.7 of our text) find $f'(a)$ for the given $f(x)$.

You can use the shortcut methods in Chapter 3 to check your answers, but the point of this exercise is to practice finding the derivative from its definition.

a. $x^2 - 3x + 2$ b. $3x - 5$ c. $12 - 9x^2$ d. 3

e. $2x^3 - 5x$ f. $3x^4 + 2x^2$ g. $\sqrt{2x - 1}$ h. $\sqrt{2 - 3x}$

i. $\sqrt{x^2 + 3}$ j. $\frac{1}{\sqrt{x - 9}}$ k. $\frac{1}{2x - 1}$ l. $\frac{x}{3x + 4}$

m. $\frac{1}{x^2}$ n. $\frac{3}{4 - 5x}$ o. $\frac{x + 1}{x + 3}$ p. $\frac{2}{x^2 + 3}$

Answers

1a. $2x - 3$ 1b. 3 1c. $-18x$ 1d. 0 1e. $6x^2 - 5$ 1f. $12x^3 + 4x$ 1g. $\frac{1}{\sqrt{2x-1}}$ 1h. $\frac{-3}{2\sqrt{2-3x}}$ 1i. $\frac{x}{\sqrt{x^2+3}}$ 1j. $\frac{-1}{2(x-9)^{3/2}}$ 1k. $\frac{-2}{(2x-1)^2}$
1l. $\frac{4}{(3x+4)^2}$ 1m. $\frac{-2}{x^3}$ 1n. $\frac{15}{(4-5x)^2}$ 1o. $\frac{2}{(x+3)^2}$ 1p. $\frac{-4x}{(x^2+3)^2}$