Name

# Derivative Rules - Multi Chain Natural and General Exponential to Derivative

**1** Find the derivative f'(x) using the chain, natural exponential, and general exponential rules.

$$f(x) = (5e^x + 5 \cdot 9^x)^{\frac{1}{3}}$$

A $f'(x) = \frac{1}{3}(5e^x + 5 \cdot 9^x)^{\frac{1}{3}} \cdot (5e^x + 5 \cdot 9^x \ln 9)$

B $f'(x) = (5e^x + 5 \cdot 9^x)^{-\frac{2}{3}} \cdot (5e^x + 5 \cdot 9^x \ln 9)$

C $f'(x) = \frac{1}{3}(5e^x + 5 \cdot 9^x)^{-\frac{2}{3}} \cdot (5e^x + 5 \cdot 9^x \ln 9)$

D $f'(x) = \frac{1}{3}(5e^x + 5 \cdot 9^x)^{-\frac{2}{3}}$

**2** Find the derivative f'(x) using the chain, natural exponential, and general exponential rules.

$$f(x) = (5e^x + 9^x)^4$$

A $f'(x) = 4(5e^x + 9^x)^4 \cdot (5e^x + 9^x \ln 9)$

B $f'(x) = (5e^x + 9^x)^3 \cdot (5e^x + 9^x \ln 9)$

C $f'(x) = 4(5e^x + 9^x)^3$

D $f'(x) = 4(5e^x + 9^x)^3 \cdot (5e^x + 9^x \ln 9)$

**3** Find the derivative f'(x) using the chain, natural exponential, and general exponential rules.

$$f(x) = \sqrt[3]{(3e^x + 8^x)}$$

A $f'(x) = (3e^x + 8^x)^{-\frac{2}{3}} \cdot (3e^x + 8^x \ln 8)$

B $f'(x) = \frac{1}{3}(3e^x + 8^x)^{-\frac{2}{3}} \cdot (3e^x + 8^x \ln 8)$

C $f'(x) = \frac{1}{3}(3e^x + 8^x)^{\frac{1}{3}} \cdot (3e^x + 8^x \ln 8)$

D $f'(x) = \frac{1}{3}(3e^x + 8^x)^{-\frac{2}{3}}$

**4** Find the derivative f'(x) using the chain, natural exponential, and general exponential rules.

$$f(x) = (5e^x + 5 \cdot 2^x)^3$$

A $f'(x) = (5e^x + 5 \cdot 2^x)^2 \cdot (5e^x + 5 \cdot 2^x \ln 2)$

B $f'(x) = 3(5e^x + 5 \cdot 2^x)^3 \cdot (5e^x + 5 \cdot 2^x \ln 2)$

C $f'(x) = 3(5e^x + 5 \cdot 2^x)^2 \cdot (5e^x + 5 \cdot 2^x \ln 2)$

D $f'(x) = 3(5e^x + 5 \cdot 2^x)^2$

**5** Find the derivative f'(x) using the chain, natural exponential, and general exponential rules.

$$f(x) = (4e^x + 5 \cdot 8^x)^{\frac{1}{3}}$$

A $f'(x) = \frac{1}{3}(4e^x + 5 \cdot 8^x)^{\frac{1}{3}} \cdot (4e^x + 5 \cdot 8^x \ln 8)$

B $f'(x) = (4e^x + 5 \cdot 8^x)^{-\frac{2}{3}} \cdot (4e^x + 5 \cdot 8^x \ln 8)$

C $f'(x) = \frac{1}{3}(4e^x + 5 \cdot 8^x)^{-\frac{2}{3}} \cdot (4e^x + 5 \cdot 8^x \ln 8)$

D $f'(x) = \frac{1}{3}(4e^x + 5 \cdot 8^x)^{-\frac{2}{3}}$

**6** Find the derivative f'(x) using the chain, natural exponential, and general exponential rules.

$$f(x) = (2e^x + 7^x)^2$$

A $f'(x) = 2(2e^x + 7^x)^2 \cdot (2e^x + 7^x \ln 7)$

B $f'(x) = 2(2e^x + 7^x) \cdot (2e^x + 7^x \ln 7)$

C $f'(x) = (2e^x + 7^x) \cdot (2e^x + 7^x \ln 7)$

D $f'(x) = 2(2e^x + 7^x)$

**7** Find the derivative f'(x) using the chain, natural exponential, and general exponential rules.

$$f(x) = \frac{1}{(2e^x + 3 \cdot 6^x)}$$

A $f'(x) = (2e^x + 3 \cdot 6^x)^{-2} \cdot (2e^x + 3 \cdot 6^x \ln 6)$

B $f'(x) = -(2e^x + 3 \cdot 6^x)^{-1} \cdot (2e^x + 3 \cdot 6^x \ln 6)$

C $f'(x) = -(2e^x + 3 \cdot 6^x)^{-2}$

D $f'(x) = -(2e^x + 3 \cdot 6^x)^{-2} \cdot (2e^x + 3 \cdot 6^x \ln 6)$

**8** Find the derivative f'(x) using the chain, natural exponential, and general exponential rules.

$$f(x) = (e^x + 4 \cdot 8^x)^3$$

A $f'(x) = 3(e^x + 4 \cdot 8^x)^2 \cdot (e^x + 4 \cdot 8^x \ln 8)$

B $f'(x) = 3(e^x + 4 \cdot 8^x)^2$

C $f'(x) = 3(e^x + 4 \cdot 8^x)^3 \cdot (e^x + 4 \cdot 8^x \ln 8)$

D $f'(x) = (e^x + 4 \cdot 8^x)^2 \cdot (e^x + 4 \cdot 8^x \ln 8)$