Name



Derivative Rules - Practice

1 Find the derivative f'(x) using the product rule.

if $h(x) = f(x)\,g(x),\ h'(x) = f'(x)\,g(x) + f(x)\,g'(x)$

$[12pt] f(x) = (4x^{-\frac{3}{2}} + 2)(5x + 6)$

A

$$f'(x) = (-6x^{-\frac{5}{2}})(5x + 6) + (4x^{-\frac{3}{2}} + 2)(5)$$

B

$$f'(x) = (-6x^{-\frac{5}{2}})(5)$$

C

$$f'(x) = (-6x^{-\frac{5}{2}})(5x + 6) - (4x^{-\frac{3}{2}} + 2)(5)$$

D

$$f'(x) = (-6x^{-\frac{5}{2}})(5x + 6)$$

2 Find the derivative f'(x) using the product rule.

$$f(x) = (5x^{-\frac{3}{2}} + 3)(4x^2 - 2)$$

A

$$f'(x) = (-\frac{15}{2}x^{-\frac{5}{2}})(4x^2 - 2) + (5x^{-\frac{3}{2}} + 3)(8x)$$

B

$$f'(x) = (-\frac{15}{2}x^{-\frac{5}{2}})(4x^2 - 2)$$

C

$$f'(x) = (-\frac{15}{2}x^{-\frac{5}{2}})(8x)$$

D

$$f'(x) = (-\frac{15}{2}x^{-\frac{5}{2}})(4x^2 - 2) - (5x^{-\frac{3}{2}} + 3)(8x)$$

3 Find the derivative f'(x) using the product rule.

if $h(x) = f(x)\,g(x),\ h'(x) = f'(x)\,g(x) + f(x)\,g'(x)$

$[12pt] f(x) = (-4\sqrt[3]{x^2} + 2)(-5x^2 + 4)$

A

$$f'(x) = (-\frac{8}{3}x^{-\frac{1}{3}})(-5x^2 + 4) + (-4x^{\frac{2}{3}} + 2)(-10x)$$

B

$$f'(x) = (-\frac{8}{3}x^{-\frac{1}{3}})(-10x)$$

C

$$f'(x) = (-\frac{8}{3}x^{-\frac{1}{3}})(-5x^2 + 4) - (-4x^{\frac{2}{3}} + 2)(-10x)$$

D

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

4 Find the derivative f'(x) using the product rule.

$$f(x) = (-3\sqrt[3]{x^4} + 4)(-5x^2)$$

A

$$f'(x) = (-4x^{\frac{1}{3}})(-5x^2) + (-3x^{\frac{4}{3}} + 4)(-10x)$$

B

$$f'(x) = (-4x^{\frac{1}{3}})(-5x^2)$$

C

$$f'(x) = (-4x^{\frac{1}{3}})(-5x^2) - (-3x^{\frac{4}{3}} + 4)(-10x)$$

D

$$f'(x) = (-4x^{\frac{1}{3}})(-10x)$$

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Derivative Rules - Practice

5 Find the derivative f'(x) using the product rule.

if $h(x) = f(x)\,g(x),\ h'(x) = f'(x)\,g(x) + f(x)\,g'(x)$

$[12pt] f(x) = (-\frac{4}{\sqrt[3]{x^4}} - 4)(5x + 2)$

A

$$f'(x) = (\frac{16}{3}x^{-\frac{7}{3}})(5)$$

B

$$f'(x) = (\frac{16}{3}x^{-\frac{7}{3}})(5x + 2) + (-4x^{-\frac{4}{3}} - 4)(5)$$

C

$$f'(x) = (\frac{16}{3}x^{-\frac{7}{3}})(5x + 2)$$

D

$$f'(x) = (\frac{16}{3}x^{-\frac{7}{3}})(5x + 2) - (-4x^{-\frac{4}{3}} - 4)(5)$$

6 Find the derivative f'(x) using the product rule.

$$f(x) = (-\frac{4}{\sqrt{x^3}} + 5)(-3x^2 - 7)$$

A

$$f'(x) = (6x^{-\frac{5}{2}})(-3x^2 - 7) + (-4x^{-\frac{3}{2}} + 5)(-6x)$$

B

$$f'(x) = (6x^{-\frac{5}{2}})(-3x^2 - 7)$$

C

$$f'(x) = (6x^{-\frac{5}{2}})(-3x^2 - 7) - (-4x^{-\frac{3}{2}} + 5)(-6x)$$

D

$$f'(x) = (6x^{-\frac{5}{2}})(-6x)$$

7 Find the derivative f'(x) using the quotient rule.

if $h(x) = \frac{f(x)}{g(x)},\ h'(x) = \frac{f'(x)\,g(x) - f(x)\,g'(x)}{[g(x)]^2}$

$[12pt] f(x) = \frac{-5x^3 + 6}{2x^2}$

A

$$f'(x) = \frac{(-15x^2)(2x^2) - (-5x^3 + 6)(4x)}{(2x^2)}$$

B

$$f'(x) = \frac{(-15x^2)(2x^2) + (-5x^3 + 6)(4x)}{(2x^2)^2}$$

C

$$f'(x) = \frac{(-15x^2)(2x^2) - (-5x^3 + 6)(4x)}{(2x^2)^2}$$

D

$$f'(x) = \frac{(-5x^3 + 6)(4x) - (-15x^2)(2x^2)}{(2x^2)^2}$$

8 Find the derivative f'(x) using the quotient rule.

$$f(x) = \frac{4x^4 + 3}{-3x}$$

A

$$f'(x) = \frac{(4x^4 + 3)(-3) - (16x^3)(-3x)}{(-3x)^2}$$

B

$$f'(x) = \frac{(16x^3)(-3x) - (4x^4 + 3)(-3)}{(-3x)}$$

C

$$f'(x) = \frac{(16x^3)(-3x) + (4x^4 + 3)(-3)}{(-3x)^2}$$

D

$$f'(x) = \frac{(16x^3)(-3x) - (4x^4 + 3)(-3)}{(-3x)^2}$$

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Derivative Rules - Practice

9 Find the derivative f'(x) using the quotient rule.

if $h(x) = \frac{f(x)}{g(x)}$, $h'(x) = \frac{f'(x)\,g(x) - f(x)\,g'(x)}{[g(x)]^2}$

$[12pt] f(x) = \frac{5x^{-1} + 4}{-4x^2 + 2}$

A $f'(x) = \frac{(-5x^{-2})(-4x^2+2) - (5x^{-1}+4)(-8x)}{(-4x^2+2)^2}$

B $f'(x) = \frac{(-5x^{-2})(-4x^2+2) + (5x^{-1}+4)(-8x)}{(-4x^2+2)^2}$

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

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

10 Find the derivative f'(x) using the quotient rule.

$$f(x) = \frac{2x^{-2} - 5}{-3x - 4}$$

A $f'(x) = \frac{(-4x^{-3})(-3x-4) - (2x^{-2}-5)(-3)}{(-3x-4)}$

B $f'(x) = \frac{(2x^{-2}-5)(-3) - (-4x^{-3})(-3x-4)}{(-3x-4)^2}$

C $f'(x) = \frac{(-4x^{-3})(-3x-4) - (2x^{-2}-5)(-3)}{(-3x-4)^2}$

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

11 Find the derivative f'(x) using the quotient rule.

if $h(x) = \frac{f(x)}{g(x)}$, $h'(x) = \frac{f'(x)\,g(x) - f(x)\,g'(x)}{[g(x)]^2}$

$[12pt] f(x) = \frac{3x^{\frac{3}{2}} - 5}{4x^2}$

A $f'(x) = \frac{(\frac{9}{2}x^{\frac{1}{2}})(4x^2) + (3x^{\frac{3}{2}}-5)(8x)}{(4x^2)^2}$

B $f'(x) = \frac{(\frac{9}{2}x^{\frac{1}{2}})(4x^2) - (3x^{\frac{3}{2}}-5)(8x)}{(4x^2)^2}$

C $f'(x) = \frac{(3x^{\frac{3}{2}}-5)(8x) - (\frac{9}{2}x^{\frac{1}{2}})(4x^2)}{(4x^2)^2}$

D $f'(x) = \frac{(\frac{9}{2}x^{\frac{1}{2}})(4x^2) - (3x^{\frac{3}{2}}-5)(8x)}{(4x^2)}$

12 Find the derivative f'(x) using the quotient rule.

$$f(x) = \frac{4x^{\frac{3}{2}} + 4}{-4x^2 + 6}$$

A $f'(x) = \frac{(6x^{\frac{1}{2}})(-4x^2+6) + (4x^{\frac{3}{2}}+4)(-8x)}{(-4x^2+6)^2}$

B $f'(x) = \frac{(6x^{\frac{1}{2}})(-4x^2+6) - (4x^{\frac{3}{2}}+4)(-8x)}{(-4x^2+6)}$

C $f'(x) = \frac{(4x^{\frac{3}{2}}+4)(-8x) - (6x^{\frac{1}{2}})(-4x^2+6)}{(-4x^2+6)^2}$

D $f'(x) = \frac{(6x^{\frac{1}{2}})(-4x^2+6) - (4x^{\frac{3}{2}}+4)(-8x)}{(-4x^2+6)^2}$

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Derivative Rules - Practice

13 Find the derivative f'(x) using the quotient rule.

if $h(x)=\frac{f(x)}{g(x)}$, $h'(x)=\frac{f'(x)\,g(x)-f(x)\,g'(x)}{[g(x)]^2}$

$[12pt]f(x)=\frac{-\frac{2}{x^3}-5}{5x^2-3}$

A $f'(x)=\frac{(6x^{-4})(5x^2-3)-(-2x^{-3}-5)(10x)}{(5x^2-3)}$

B $f'(x)=\frac{(6x^{-4})(5x^2-3)+(-2x^{-3}-5)(10x)}{(5x^2-3)^2}$

C $f'(x)=\frac{(-2x^{-3}-5)(10x)-(6x^{-4})(5x^2-3)}{(5x^2-3)^2}$

D $f'(x)=\frac{(6x^{-4})(5x^2-3)-(-2x^{-3}-5)(10x)}{(5x^2-3)^2}$

14 Find the derivative f'(x) using the quotient rule.

$$f(x)=\frac{-\frac{4}{x^2}+4}{-4x}$$

A $f'(x)=\frac{(8x^{-3})(-4x)+(-4x^{-2}+4)(-4)}{(-4x)^2}$

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

C $f'(x)=\frac{(8x^{-3})(-4x)-(-4x^{-2}+4)(-4)}{(-4x)}$

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

15 Find the derivative f'(x) using the quotient rule.

if $h(x)=\frac{f(x)}{g(x)}$, $h'(x)=\frac{f'(x)\,g(x)-f(x)\,g'(x)}{[g(x)]^2}$

$[12pt]f(x)=\frac{4x^{-\frac{2}{3}}-3}{-3x-2}$

A $f'(x)=\frac{(-\frac{8}{3}x^{-\frac{5}{3}})(-3x-2)+(4x^{-\frac{2}{3}}-3)(-3)}{(-3x-2)^2}$

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

C $f'(x)=\frac{(-\frac{8}{3}x^{-\frac{5}{3}})(-3x-2)-(4x^{-\frac{2}{3}}-3)(-3)}{(-3x-2)}$

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

16 Find the derivative f'(x) using the quotient rule.

$$f(x)=\frac{-5x^{-\frac{1}{2}}-2}{-2x^2}$$

A $f'(x)=\frac{(\frac{5}{2}x^{-\frac{3}{2}})(-2x^2)-(-5x^{-\frac{1}{2}}-2)(-4x)}{(-2x^2)}$

B $f'(x)=\frac{(-5x^{-\frac{1}{2}}-2)(-4x)-(\frac{5}{2}x^{-\frac{3}{2}})(-2x^2)}{(-2x^2)^2}$

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

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

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Derivative Rules - Practice

17 Find the derivative f'(x) using the quotient rule.

if $h(x)=\frac{f(x)}{g(x)}$, $h'(x)=\frac{f'(x)\,g(x)-f(x)\,g'(x)}{[g(x)]^2}$

$[12pt] f(x)=\frac{3\sqrt{x}+4}{-5x^2}$

A $f'(x)=\frac{(\frac{3}{2}x^{-\frac{1}{2}})(-5x^2)-(3x^{\frac{1}{2}}+4)(-10x)}{(-5x^2)^2}$

B $f'(x)=\frac{(\frac{3}{2}x^{-\frac{1}{2}})(-5x^2)-(3x^{\frac{1}{2}}+4)(-10x)}{(-5x^2)}$

C $f'(x)=\frac{(\frac{3}{2}x^{-\frac{1}{2}})(-5x^2)+(3x^{\frac{1}{2}}+4)(-10x)}{(-5x^2)^2}$

D $f'(x)=\frac{(3x^{\frac{1}{2}}+4)(-10x)-(\frac{3}{2}x^{-\frac{1}{2}})(-5x^2)}{(-5x^2)^2}$

18 Find the derivative f'(x) using the quotient rule.

$$f(x)=\frac{5\sqrt[3]{x^2}-4}{-2x^2-6}$$

A $f'(x)=\frac{(\frac{10}{3}x^{-\frac{1}{3}})(-2x^2-6)-(5x^{\frac{2}{3}}-4)(-4x)}{(-2x^2-6)^2}$

B $f'(x)=\frac{(5x^{\frac{2}{3}}-4)(-4x)-(\frac{10}{3}x^{-\frac{1}{3}})(-2x^2-6)}{(-2x^2-6)^2}$

C $f'(x)=\frac{(\frac{10}{3}x^{-\frac{1}{3}})(-2x^2-6)-(5x^{\frac{2}{3}}-4)(-4x)}{(-2x^2-6)}$

D $f'(x)=\frac{(\frac{10}{3}x^{-\frac{1}{3}})(-2x^2-6)+(5x^{\frac{2}{3}}-4)(-4x)}{(-2x^2-6)^2}$

19 Find the derivative f'(x) using the quotient rule.

if $h(x)=\frac{f(x)}{g(x)}$, $h'(x)=\frac{f'(x)\,g(x)-f(x)\,g'(x)}{[g(x)]^2}$

$[12pt] f(x)=\frac{\frac{3}{\sqrt[3]{x}}+4}{-4x}$

A $f'(x)=\frac{(-x^{-\frac{4}{3}})(-4x)-(3x^{-\frac{1}{3}}+4)(-4)}{(-4x)}$

B $f'(x)=\frac{(-x^{-\frac{4}{3}})(-4x)-(3x^{-\frac{1}{3}}+4)(-4)}{(-4x)^2}$

C $f'(x)=\frac{(3x^{-\frac{1}{3}}+4)(-4)-(-x^{-\frac{4}{3}})(-4x)}{(-4x)^2}$

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

20 Find the derivative f'(x) using the quotient rule.

$$f(x)=\frac{-\frac{3}{\sqrt[3]{x^2}}+7}{-2x-7}$$

A $f'(x)=\frac{(2x^{-\frac{5}{3}})(-2x-7)-(-3x^{-\frac{2}{3}}+7)(-2)}{(-2x-7)^2}$

B $f'(x)=\frac{(-3x^{-\frac{2}{3}}+7)(-2)-(2x^{-\frac{5}{3}})(-2x-7)}{(-2x-7)^2}$

C $f'(x)=\frac{(2x^{-\frac{5}{3}})(-2x-7)-(-3x^{-\frac{2}{3}}+7)(-2)}{(-2x-7)}$

D $f'(x)=\frac{(2x^{-\frac{5}{3}})(-2x-7)+(-3x^{-\frac{2}{3}}+7)(-2)}{(-2x-7)^2}$

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Derivative Rules - Practice

21 Find the derivative f'(x) using the chain rule.

if $y = f(g(x)),\ y' = f'(g(x)) \cdot g'(x)$

$[12pt] f(x) = (x+2)^2$

A $f'(x) = 2(x+2)^2$

B $f'(x) = (x+2)$

C $f'(x) = 2(x+2)$

22 Find the derivative f'(x) using the natural exponential rule and the chain rule.

$\frac{d}{dx}e^u = e^u \cdot \frac{du}{dx}$

$[12pt] f(x) = 5e^x$

A $f'(x) = 5(x)e^{x-1}$

B $f'(x) = 5e^x$

C $f'(x) = 5e^x \cdot (x)$

23 Find the derivative f'(x) using the chain rule.

$f(x) = (-x+5)^2$

A $f'(x) = -2(-x+5)$

B $f'(x) = 2(-x+5)$

C $f'(x) = -(-x+5)$

D $f'(x) = -2(-x+5)^2$

24 Find the derivative f'(x) using the chain rule.

if $y = f(g(x)),\ y' = f'(g(x)) \cdot g'(x)$

$[12pt] f(x) = (x^2+4)^{-2}$

A $f'(x) = -2(x^2+4)^{-3}$

B $f'(x) = (x^2+4)^{-3}(2x)$

C $f'(x) = -2(x^2+4)^{-2}(2x)$

D $f'(x) = -2(x^2+4)^{-3}(2x)$

25 Find the derivative f'(x) using the chain rule.

if $y = f(g(x)),\ y' = f'(g(x)) \cdot g'(x)$

$[12pt] f(x) = (-2x^2-6)^{\frac{1}{3}}$

A $f'(x) = (-2x^2-6)^{-\frac{2}{3}}(-4x)$

B $f'(x) = \frac{1}{3}(-2x^2-6)^{\frac{1}{3}}(-4x)$

C $f'(x) = \frac{1}{3}(-2x^2-6)^{-\frac{2}{3}}$

D $f'(x) = \frac{1}{3}(-2x^2-6)^{-\frac{2}{3}}(-4x)$

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Derivative Rules - Practice

26 Find the derivative f'(x) using the chain rule.

$$f(x) = (-3x+2)^{-2}$$

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

B $f'(x) = -2(-3x+2)^{-3}$

C $f'(x) = -3(-3x+2)^{-3}$

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

27 Find the derivative f'(x) using the chain rule.

$$f(x) = (2x+5)^{\frac{3}{2}}$$

A $f'(x) = \frac{3}{2}(2x+5)^{\frac{1}{2}}$

B $f'(x) = 3(2x+5)^{\frac{1}{2}}$

C $f'(x) = 2(2x+5)^{\frac{1}{2}}$

D $f'(x) = 3(2x+5)^{\frac{3}{2}}$

28 Find the derivative f'(x) using the chain rule.

$$\text{if } y = f(g(x)),\ y' = f'(g(x)) \cdot g'(x)$$

$$[12pt] f(x) = \frac{1}{(3x-7)^2}$$

A $f'(x) = 3(3x-7)^{-3}$

B $f'(x) = -2(3x-7)^{-3}$

C $f'(x) = -6(3x-7)^{-3}$

D $f'(x) = -6(3x-7)^{-2}$

29 Find the derivative f'(x) using the natural exponential rule and the chain rule.

$$f(x) = 5e^x$$

A $f'(x) = 5(x)e^{x-1}$

B $f'(x) = 5e^x$

C $f'(x) = 5e^x \cdot (x)$

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Derivative Rules - Practice

30 Find the derivative f'(x) using the chain rule.

$$f(x) = \frac{1}{(2x^2-2)^3}$$

A
$$f'(x) = -3(2x^2-2)^{-3}(4x)$$

B
$$f'(x) = -3(2x^2-2)^{-4}(4x)$$

C
$$f'(x) = (2x^2-2)^{-4}(4x)$$

D
$$f'(x) = -3(2x^2-2)^{-4}$$

31 Find the derivative f'(x) using the chain rule.

if $y = f(g(x)),\ y' = f'(g(x)) \cdot g'(x)$

$[12pt] f(x) = (-2x+3)^{-\frac{3}{2}}$

A
$$f'(x) = -2(-2x+3)^{-\frac{5}{2}}$$

B
$$f'(x) = 3(-2x+3)^{-\frac{3}{2}}$$

C
$$f'(x) = 3(-2x+3)^{-\frac{5}{2}}$$

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

32 Find the derivative f'(x) using the chain rule.

$$f(x) = (-2x-6)^{-\frac{2}{3}}$$

A
$$f'(x) = -2(-2x-6)^{-\frac{5}{3}}$$

B
$$f'(x) = \frac{4}{3}(-2x-6)^{-\frac{2}{3}}$$

C
$$f'(x) = \frac{4}{3}(-2x-6)^{-\frac{5}{3}}$$

D
$$f'(x) = -\frac{2}{3}(-2x-6)^{-\frac{5}{3}}$$

33 Find the derivative f'(x) using the chain rule.

if $y = f(g(x)),\ y' = f'(g(x)) \cdot g'(x)$

$[12pt] f(x) = \sqrt{(3x-4)}$

A
$$f'(x) = 3(3x-4)^{-\frac{1}{2}}$$

B
$$f'(x) = \frac{3}{2}(3x-4)^{-\frac{1}{2}}$$

C
$$f'(x) = \frac{1}{2}(3x-4)^{-\frac{1}{2}}$$

D
$$f'(x) = \frac{3}{2}(3x-4)^{\frac{1}{2}}$$

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Derivative Rules - Practice

34 Find the derivative f'(x) using the chain rule.

$$f(x) = \sqrt[3]{(-x+2)^2}$$

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

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

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

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

35 Find the derivative f'(x) using the chain rule.

if $y = f(g(x)),\ y' = f'(g(x)) \cdot g'(x)$

$[12pt] f(x) = \frac{1}{\sqrt{(3x+5)}}$

A
$$f'(x) = -\frac{3}{2}(3x+5)^{-\frac{1}{2}}$$

B
$$f'(x) = -\frac{1}{2}(3x+5)^{-\frac{3}{2}}$$

C
$$f'(x) = 3(3x+5)^{-\frac{3}{2}}$$

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

36 Find the derivative f'(x) using the chain rule.

$$f(x) = \frac{1}{\sqrt{(-2x^2-5)}}$$

A
$$f'(x) = -\frac{1}{2}(-2x^2-5)^{-\frac{1}{2}}(-4x)$$

B
$$f'(x) = (-2x^2-5)^{-\frac{3}{2}}(-4x)$$

C
$$f'(x) = -\frac{1}{2}(-2x^2-5)^{-\frac{3}{2}}(-4x)$$

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

37 Find the derivative f'(x) using the natural exponential rule and the chain rule.

$$\frac{d}{dx}e^u = e^u \cdot \frac{du}{dx}$$

$[12pt] f(x) = 2e^{2\pi x}$

A
$$f'(x) = 2(2\pi x)e^{2\pi x-1}$$

B
$$f'(x) = 4\pi e^{2\pi x}$$

C
$$f'(x) = 2e^{2\pi x} \cdot (2\pi x)$$

D
$$f'(x) = 2e^{2\pi x}$$

Name



Derivative Rules - Practice

38 Find the derivative f'(x) using the natural exponential rule and the chain rule.

$$f(x) = 3e^{\frac{1}{3}\pi x}$$

A

$$f'(x) = 3e^{\frac{1}{3}\pi x} \cdot (\frac{1}{3}\pi x)$$

B

$$f'(x) = 3e^{\frac{1}{3}\pi x}$$

C

$$f'(x) = 3(\frac{1}{3}\pi x)e^{\frac{1}{3}\pi x - 1}$$

D

$$f'(x) = \pi e^{\frac{1}{3}\pi x}$$

39 Find the derivative f'(x) using the natural exponential rule and the chain rule.

$$\frac{d}{dx}e^u = e^u \cdot \frac{du}{dx}$$

$$[12pt] f(x) = 4e^{x^4}$$

A

$$f'(x) = 4e^{x^4} \cdot 4x^3$$

B

$$f'(x) = 4e^{x^4} \cdot (x^4)$$

C

$$f'(x) = 4(x^4)e^{x^4 - 1}$$

D

$$f'(x) = 4e^{x^4}$$

40 Find the derivative f'(x) using the natural exponential rule and the chain rule.

$$f(x) = 4e^{x^{\frac{1}{2}}}$$

A

$$f'(x) = 4e^{x^{\frac{1}{2}}}$$

B

$$f'(x) = 4e^{x^{\frac{1}{2}}} \cdot (x^{\frac{1}{2}})$$

C

$$f'(x) = 4e^{x^{\frac{1}{2}}} \cdot \frac{1}{2}x^{-\frac{1}{2}}$$

D

$$f'(x) = 4(x^{\frac{1}{2}})e^{x^{\frac{1}{2}} - 1}$$

41 Find the derivative f'(x) using the natural exponential rule and the chain rule.

$$\frac{d}{dx}e^u = e^u \cdot \frac{du}{dx}$$

$$[12pt] f(x) = 2e^{x^2 - 3x}$$

A

$$f'(x) = 2(x^2 - 3x)e^{x^2 - 3x - 1}$$

B

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

C

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

D

$$f'(x) = 2e^{x^2 - 3x}$$