**Differentiate trigonometric functions****1**

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

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

A

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

B

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

C

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

D

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

2

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

$$\text{if } h(x) = f(x)g(x), \quad h'(x) = f'(x)g(x) + f(x)g'(x)$$

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

A

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

B

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

C

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

D

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

3

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

$$\text{if } h(x) = f(x)g(x), \quad h'(x) = f'(x)g(x) + f(x)g'(x)$$

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

A

$$f'(x) = (-9x^{-4})(4x)$$

B

$$f'(x) = (-9x^{-4})(2x^2 - 3) - (3x^{-3} - 4)(4x)$$

C

$$f'(x) = (-9x^{-4})(2x^2 - 3) + (3x^{-3} - 4)(4x)$$

D

$$f'(x) = (-9x^{-4})(2x^2 - 3)$$

4

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

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

A

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

B

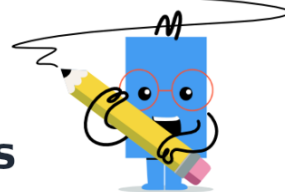
$$f'(x) = (4x^{-3})(-5x^2) - (-2x^{-2} + 6)(-10x)$$

C

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

D

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

**Differentiate trigonometric functions****5**

Find the derivative $f'(x)$ using the trigonometric rules and the chain rule.

$$\frac{d}{dx} \sin(u) = \cos(u) \cdot \frac{du}{dx}$$

$$[12pt] f(x) = 3 \sin\left(\frac{1}{3}\pi x\right)$$

A

$$f'(x) = 3 \cos\left(\frac{1}{3}\pi x\right)$$

B

$$f'(x) = \pi \sin\left(\frac{1}{3}\pi x\right)$$

C

$$f'(x) = \pi \cos\left(\frac{1}{3}\pi x\right)$$

D

$$f'(x) = 3 \cos\left(\frac{1}{3}\pi x\right) \cdot \left(\frac{1}{3}\pi x\right)$$

6

Find the derivative $f'(x)$ using the trigonometric rules and the chain rule.

$$\frac{d}{dx} \cos(u) = -\sin(u) \cdot \frac{du}{dx}$$

$$[12pt] f(x) = 3 \cos\left(x^{\frac{1}{2}}\right)$$

A

$$f'(x) = 3 \cos\left(x^{\frac{1}{2}}\right) \cdot \frac{1}{2}x^{-\frac{1}{2}}$$

B

$$f'(x) = -3 \sin\left(x^{\frac{1}{2}}\right) \cdot \left(x^{\frac{1}{2}}\right)$$

C

$$f'(x) = -3 \sin\left(x^{\frac{1}{2}}\right) \cdot \frac{1}{2}x^{-\frac{1}{2}}$$

D

$$f'(x) = -3 \sin\left(x^{\frac{1}{2}}\right)$$

7

Find the derivative $f'(x)$ using the trigonometric rules and the chain rule.

$$\frac{d}{dx} \cos(u) = -\sin(u) \cdot \frac{du}{dx}$$

$$[12pt] f(x) = 3 \cos\left(\frac{1}{x^3}\right)$$

A

$$f'(x) = -3 \sin\left(\frac{1}{x^3}\right)$$

B

$$f'(x) = -3 \sin\left(\frac{1}{x^3}\right) \cdot \left(-\frac{3}{x^4}\right)$$

C

$$f'(x) = -3 \sin\left(\frac{1}{x^3}\right) \cdot \left(\frac{1}{x^3}\right)$$

D

$$f'(x) = 3 \cos\left(\frac{1}{x^3}\right) \cdot \left(-\frac{3}{x^4}\right)$$

8

Find the derivative $f'(x)$ using the trigonometric rules and the chain rule.

$$\frac{d}{dx} \sin(u) = \cos(u) \cdot \frac{du}{dx}$$

$$[12pt] f(x) = 2 \sin\left(\frac{3}{\sqrt[3]{x}}\right)$$

A

$$f'(x) = 2 \cos\left(\frac{3}{\sqrt[3]{x}}\right) \cdot \left(-\frac{1}{\sqrt[3]{x^4}}\right)$$

B

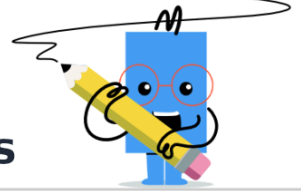
$$f'(x) = 2 \cos\left(\frac{3}{\sqrt[3]{x}}\right) \cdot \left(\frac{3}{\sqrt[3]{x}}\right)$$

C

$$f'(x) = 2 \cos\left(\frac{3}{\sqrt[3]{x}}\right)$$

D

$$f'(x) = 2 \sin\left(\frac{3}{\sqrt[3]{x}}\right) \cdot \left(-\frac{1}{\sqrt[3]{x^4}}\right)$$

**Differentiate trigonometric functions****9**

Find the derivative $f'(x)$ using the trigonometric rules and the chain rule.

$$\frac{d}{dx} \sin(u) = \cos(u) \cdot \frac{du}{dx}$$

[12pt] $f(x) = 2 \sin(3x^2 - 2x)$

A

$$f'(x) = 2 \cos(3x^2 - 2x)$$

B

$$f'(x) = 2 \cos(3x^2 - 2x) \cdot (6x - 2)$$

C

$$f'(x) = 2 \cos(3x^2 - 2x) \cdot (3x^2 - 2x)$$

D

$$f'(x) = 2 \sin(3x^2 - 2x) \cdot (6x - 2)$$

10

Find the derivative $f'(x)$ using the trigonometric rules and the chain rule.

$$f(x) = 4 \sin\left(\frac{1}{2}\pi x\right)$$

A

$$f'(x) = 2\pi \sin\left(\frac{1}{2}\pi x\right)$$

B

$$f'(x) = 2\pi \cos\left(\frac{1}{2}\pi x\right)$$

C

$$f'(x) = 4 \cos\left(\frac{1}{2}\pi x\right)$$

D

$$f'(x) = 4 \cos\left(\frac{1}{2}\pi x\right) \cdot \left(\frac{1}{2}\pi x\right)$$

11

Find the derivative $f'(x)$ using the product, chain, and trigonometric rules.

$$\frac{d}{dx} \cos(x) = -\sin(x)$$

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

A

$$f'(x) = 6(3x - 5) (4 \cos(x))$$

B

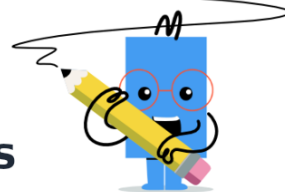
$$f'(x) = 6(3x - 5) (4 \cos(x)) + (3x - 5)^2 (-4 \sin(x))$$

C

$$f'(x) = (3x - 5)^2 (-4 \sin(x))$$

D

$$f'(x) = 6(3x - 5) (-4 \sin(x))$$



Differentiate trigonometric functions

12Find the derivative $f'(x)$ using the trigonometric rules and the chain rule.

$$f(x) = 3 \cos x$$

A

$$f'(x) = 3 \cos(x)$$

B

$$f'(x) = -3 \sin(x) \cdot (x)$$

C

$$f'(x) = -3 \sin(x)$$

D

$$f'(x) = 3 \sin(x)$$

13Find the derivative $f'(x)$ using the trigonometric rules and the chain rule.

$$f(x) = \cos(x^2 - 2x)$$

A

$$f'(x) = -\sin(x^2 - 2x) \cdot (x^2 - 2x)$$

B

$$f'(x) = -\sin(x^2 - 2x)$$

C

$$f'(x) = -\sin(x^2 - 2x) \cdot (2x - 2)$$

D

$$f'(x) = \cos(x^2 - 2x) \cdot (2x - 2)$$

14Find the derivative $f'(x)$ using the trigonometric rules and the chain rule.

$$f(x) = 4 \sin(x^2)$$

A

$$f'(x) = 4 \sin(x^2) \cdot 2x$$

B

$$f'(x) = 4 \cos(x^2)$$

C

$$f'(x) = 4 \cos(x^2) \cdot 2x$$

D

$$f'(x) = 4 \cos(x^2) \cdot (x^2)$$

15Find the derivative $f'(x)$ using the product, chain, and trigonometric rules.

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

A

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

B

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

C

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

D

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