

Use the chain rule to find the derivative of each function.

1

$$y = (3x + 2)^5$$

$$y = u^5$$

$$u = 3x + 2$$

$$\frac{dy}{du} = 5u^4$$

$$\frac{du}{dx} = 3$$

$$\frac{dy}{du} \times \frac{du}{dx} = 15u^4$$

$$\frac{dy}{dx} = 15(3x + 2)^4$$

2

$$y = (5x + 2)^4$$

$$y = u^4$$

$$u = 5x + 2$$

$$\frac{dy}{du} =$$

$$\frac{du}{dx} =$$

$$\frac{dy}{du} \times \frac{du}{dx} =$$

$$\frac{dy}{dx} = 20(5x + 2)^3$$

3

$$y = (6x - 1)^7$$

$$y =$$

$$u =$$

$$\frac{dy}{du} =$$

$$\frac{du}{dx} =$$

$$\frac{dy}{du} \times \frac{du}{dx} =$$

$$\frac{dy}{dx} =$$

4

$$y = (4 - 6x)^3$$

$$y =$$

$$u =$$

$$\frac{dy}{du} =$$

$$\frac{du}{dx} =$$

$$\frac{dy}{du} \times \frac{du}{dx} =$$

$$\frac{dy}{dx} =$$

5

$$y = (2x - 3)^{-5}$$

$$y =$$

$$u =$$

$$\frac{dy}{du} =$$

$$\frac{du}{dx} =$$

$$\frac{dy}{du} \times \frac{du}{dx} =$$

$$\frac{dy}{dx} =$$

6

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

$$y =$$

$$u =$$

$$\frac{dy}{du} =$$

$$\frac{du}{dx} =$$

$$\frac{dy}{du} \times \frac{du}{dx} =$$

$$\frac{dy}{dx} =$$

Use the chain rule to find the derivative of each function.

7

$$y = \sqrt{3x + 2}$$

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

$$y =$$

$$u =$$

$$\frac{dy}{du} =$$

$$\frac{du}{dx} =$$

$$\frac{dy}{du} \times \frac{du}{dx} =$$

$$\frac{dy}{dx} =$$

$$\frac{dy}{dx} = \frac{3}{2\sqrt{3x + 2}}$$

8

$$y = \sqrt{5x - 4}$$

$$y =$$

$$y =$$

$$u =$$

$$\frac{dy}{du} =$$

$$\frac{du}{dx} =$$

$$\frac{dy}{du} \times \frac{du}{dx} =$$

$$\frac{dy}{dx} =$$

$$\frac{dy}{dx} =$$

9

$$y = \frac{1}{4x - 5}$$

$$y = (4x - 5)^{-1}$$

$$y =$$

$$u =$$

$$\frac{dy}{du} =$$

$$\frac{du}{dx} =$$

$$\frac{dy}{du} \times \frac{du}{dx} =$$

$$\frac{dy}{dx} =$$

$$\frac{dy}{dx} =$$

10

$$y = \frac{1}{(7x - 2)^2}$$

$$y =$$

$$y =$$

$$u =$$

$$\frac{dy}{du} =$$

$$\frac{du}{dx} =$$

$$\frac{dy}{du} \times \frac{du}{dx} =$$

$$\frac{dy}{dx} =$$

$$\frac{dy}{dx} =$$

11

$$y = \frac{1}{\sqrt{3x + 2}}$$

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

$$y =$$

$$u =$$

$$\frac{dy}{du} =$$

$$\frac{du}{dx} =$$

$$\frac{dy}{du} \times \frac{du}{dx} =$$

$$\frac{dy}{dx} =$$

$$\frac{dy}{dx} =$$

12

$$y = \frac{3}{2\sqrt{4x - 7}}$$

$$y =$$

$$y =$$

$$u =$$

$$\frac{dy}{du} =$$

$$\frac{du}{dx} =$$

$$\frac{dy}{du} \times \frac{du}{dx} =$$

$$\frac{dy}{dx} =$$

$$\frac{dy}{dx} =$$

Use the chain rule to find the derivative of each function.

13

$$y = \sin^2 x$$

$$y = (\sin x)^2$$

$$y = u^2$$

$$u = \sin x$$

$$\frac{dy}{du} =$$

$$\frac{du}{dx} =$$

$$\frac{dy}{du} \times \frac{du}{dx} =$$

$$\frac{dy}{dx} =$$

14

$$y = 3\sin 2x$$

$$y = 3\sin(2x)$$

$$y = 3\sin u$$

$$u = 2x$$

$$\frac{dy}{du} =$$

$$\frac{du}{dx} =$$

$$\frac{dy}{du} \times \frac{du}{dx} =$$

$$\frac{dy}{dx} =$$

15

$$y = \cos^2 x$$

$$y =$$

$$y =$$

$$u =$$

$$\frac{dy}{du} =$$

$$\frac{du}{dx} =$$

$$\frac{dy}{du} \times \frac{du}{dx} =$$

$$\frac{dy}{dx} =$$

16

$$y = \cos x^2$$

$$y = \cos(x^2)$$

$$y =$$

$$u =$$

$$\frac{dy}{du} =$$

$$\frac{du}{dx} =$$

$$\frac{dy}{du} \times \frac{du}{dx} =$$

$$\frac{dy}{dx} =$$

17

$$y = 5\sin 3x$$

$$y =$$

$$y =$$

$$u =$$

$$\frac{dy}{du} =$$

$$\frac{du}{dx} =$$

$$\frac{dy}{du} \times \frac{du}{dx} =$$

$$\frac{dy}{dx} =$$

18

$$y = -2\cos^3 x$$

$$y =$$

$$y =$$

$$u =$$

$$\frac{dy}{du} =$$

$$\frac{du}{dx} =$$

$$\frac{dy}{du} \times \frac{du}{dx} =$$

$$\frac{dy}{dx} =$$