1. Suppose f and g are differentiable functions where $g(x) = f^{-1}(x)$ for all x. Suppose further that

$$f(4) = 5, \quad f(3) = 7, \quad f(7) = 4, \quad f(5) = 3$$
$$f'(4) = -9, \quad f'(3) = 10, \quad f'(7) = -7, \quad f'(5) = 6$$

Find $g'(5)$.

Solution:

$$g'(5) = \frac{1}{f'(g(5))} = \frac{1}{f'(4)} = \frac{1}{-9}$$

2. Suppose f and g are differentiable functions where $g(x) = f^{-1}(x)$ for all x. Suppose further that

$$f(6) = 2, \quad f(2) = 7, \quad f(1) = 6, \quad f(7) = 1$$
$$f'(6) = 2, \quad f'(2) = -9, \quad f'(1) = 4, \quad f'(7) = 1$$

Find $g'(1)$.

Solution:

$$g'(1) = \frac{1}{f'(g(1))} = \frac{1}{f'(7)} = \frac{1}{1}$$

3. Suppose f and g are differentiable functions where $g(x) = f^{-1}(x)$ for all x. Suppose further that

$$f(2) = -3, \quad f(7) = 2, \quad f(-3) = -8, \quad f(-8) = 7$$
$$f'(2) = 2, \quad f'(7) = 8, \quad f'(-3) = 4, \quad f'(-8) = 5$$

Find $g'(-3)$.

Solution:

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

4. Suppose f and g are differentiable functions where $g(x) = f^{-1}(x)$ for all x. Suppose further that

$$f(1) = 7, \quad f(-8) = 1, \quad f(7) = -3, \quad f(-3) = -8$$
$$f'(1) = -10, \quad f'(-8) = -4, \quad f'(7) = 8, \quad f'(-3) = 10$$

Find $g'(7)$.

Solution:

$$g'(7) = \frac{1}{f'(g(7))} = \frac{1}{f'(1)} = \frac{1}{-10}$$

5. Suppose f and g are differentiable functions where $g(x) = f^{-1}(x)$ for all x. Suppose further that

$$f(6) = 0, \quad f(-3) = 6, \quad f(0) = 7, \quad f(7) = -3$$
$$f'(6) = -4, \quad f'(-3) = 5, \quad f'(0) = 7, \quad f'(7) = 4$$

Find $g'(7)$.

Solution:

$$g'(7) = \frac{1}{f'(g(7))} = \frac{1}{f'(0)} = \frac{1}{7}$$

6. Suppose f and g are differentiable functions where $g(x) = f^{-1}(x)$ for all x. Suppose further that

$$f(9) = -6, \quad f(10) = 6, \quad f(6) = 10, \quad f(-6) = 9$$
$$f'(9) = 1, \quad f'(10) = 2, \quad f'(6) = 9, \quad f'(-6) = -1$$

Find $g'(10)$.

Solution:

$$g'(10) = \frac{1}{f'(g(10))} = \frac{1}{f'(6)} = \frac{1}{9}$$

7. Suppose f and g are differentiable functions where $g(x) = f^{-1}(x)$ for all x. Suppose further that

$$f(7) = -1, \quad f(4) = 7, \quad f(3) = 4, \quad f(-1) = 3$$
$$f'(7) = -4, \quad f'(4) = 4, \quad f'(3) = 8, \quad f'(-1) = -6$$

Find $g'(7)$.

Solution:

$$g'(7) = \frac{1}{f'(g(7))} = \frac{1}{f'(4)} = \frac{1}{4}$$

8. Suppose f and g are differentiable functions where $g(x) = f^{-1}(x)$ for all x. Suppose further that

$$f(-9) = 7, \quad f(8) = 6, \quad f(6) = -9, \quad f(7) = 8$$
$$f'(-9) = 6, \quad f'(8) = 4, \quad f'(6) = -4, \quad f'(7) = 3$$

Find $g'(-9)$.

Solution:

$$g'(-9) = \frac{1}{f'(g(-9))} = \frac{1}{f'(6)} = \frac{1}{-4}$$

9. Suppose f and g are differentiable functions where $g(x) = f^{-1}(x)$ for all x. Suppose further that

$$f(3) = -9, \quad f(-9) = -2, \quad f(9) = 3, \quad f(-2) = 9$$
$$f'(3) = 8, \quad f'(-9) = -4, \quad f'(9) = -10, \quad f'(-2) = -5$$

Find $g'(-9)$.

Solution:

$$g'(-9) = \frac{1}{f'(g(-9))} = \frac{1}{f'(3)} = \frac{1}{8}$$

10. Suppose f and g are differentiable functions where $g(x) = f^{-1}(x)$ for all x. Suppose further that

$$f(3) = 6, \quad f(6) = -9, \quad f(-9) = -1, \quad f(-1) = 3$$
$$f'(3) = 10, \quad f'(6) = 4, \quad f'(-9) = 1, \quad f'(-1) = 7$$

Find $g'(-9)$.

Solution:

$$g'(-9) = \frac{1}{f'(g(-9))} = \frac{1}{f'(6)} = \frac{1}{4}$$

11. Suppose f and g are differentiable functions where $g(x) = f^{-1}(x)$ for all x. Suppose further that

$$f(-3) = 0, \quad f(0) = 8, \quad f(1) = -3, \quad f(8) = 1$$
$$f'(-3) = -8, \quad f'(0) = -10, \quad f'(1) = -9, \quad f'(8) = -6$$

Find $g'(-3)$.

Solution:

$$g'(-3) = \frac{1}{f'(g(-3))} = \frac{1}{f'(1)} = \frac{1}{-9}$$

12. Suppose f and g are differentiable functions where $g(x) = f^{-1}(x)$ for all x. Suppose further that

$$f(0) = 1, \quad f(-3) = 3, \quad f(3) = 0, \quad f(1) = -3$$
$$f'(0) = -10, \quad f'(-3) = -7, \quad f'(3) = 4, \quad f'(1) = -9$$

Find $g'(-3)$.

Solution:

$$g'(-3) = \frac{1}{f'(g(-3))} = \frac{1}{f'(1)} = \frac{1}{-9}$$

13. Suppose f and g are differentiable functions where $g(x) = f^{-1}(x)$ for all x. Suppose further that

$$f(-9) = 9, \quad f(-7) = 7, \quad f(9) = -7, \quad f(7) = -9$$
$$f'(-9) = -5, \quad f'(-7) = 1, \quad f'(9) = 5, \quad f'(7) = 10$$

Find $g'(7)$.

Solution:

$$g'(7) = \frac{1}{f'(g(7))} = \frac{1}{f'(-7)} = \frac{1}{1}$$

14. Suppose f and g are differentiable functions where $g(x) = f^{-1}(x)$ for all x. Suppose further that

$$f(9) = -10, \quad f(-10) = 1, \quad f(1) = 8, \quad f(8) = 9$$
$$f'(9) = -7, \quad f'(-10) = -2, \quad f'(1) = -8, \quad f'(8) = -10$$

Find $g'(-10)$.

Solution:

$$g'(-10) = \frac{1}{f'(g(-10))} = \frac{1}{f'(9)} = \frac{1}{-7}$$

15. Suppose f and g are differentiable functions where $g(x) = f^{-1}(x)$ for all x. Suppose further that

$$f(-4) = 4, \quad f(4) = 7, \quad f(-1) = -4, \quad f(7) = -1$$
$$f'(-4) = -6, \quad f'(4) = 2, \quad f'(-1) = -8, \quad f'(7) = -4$$

Find $g'(7)$.

Solution:

$$g'(7) = \frac{1}{f'(g(7))} = \frac{1}{f'(4)} = \frac{1}{2}$$

16. Suppose f and g are differentiable functions where $g(x) = f^{-1}(x)$ for all x. Suppose further that

$$f(10) = -4, \quad f(4) = 10, \quad f(-6) = 4, \quad f(-4) = -6$$
$$f'(10) = 10, \quad f'(4) = 9, \quad f'(-6) = -3, \quad f'(-4) = -5$$

Find $g'(10)$.

Solution:

$$g'(10) = \frac{1}{f'(g(10))} = \frac{1}{f'(4)} = \frac{1}{9}$$

17. Suppose f and g are differentiable functions where $g(x) = f^{-1}(x)$ for all x. Suppose further that

$$f(-7) = 2, \quad f(2) = -7, \quad f(0) = 7, \quad f(7) = 0$$
$$f'(-7) = -6, \quad f'(2) = 5, \quad f'(0) = -8, \quad f'(7) = 1$$

Find $g'(7)$.

Solution:

$$g'(7) = \frac{1}{f'(g(7))} = \frac{1}{f'(0)} = \frac{1}{-8}$$

18. Suppose f and g are differentiable functions where $g(x) = f^{-1}(x)$ for all x. Suppose further that

$$f(7) = 2, \quad f(-7) = 7, \quad f(-1) = -7, \quad f(2) = -1$$
$$f'(7) = 4, \quad f'(-7) = 1, \quad f'(-1) = -7, \quad f'(2) = 10$$

Find $g'(2)$.

Solution:

$$g'(2) = \frac{1}{f'(g(2))} = \frac{1}{f'(7)} = \frac{1}{4}$$

19. Suppose f and g are differentiable functions where $g(x) = f^{-1}(x)$ for all x. Suppose further that

$$f(10) = -7, \quad f(9) = 10, \quad f(-10) = 9, \quad f(-7) = -10$$
$$f'(10) = -3, \quad f'(9) = -5, \quad f'(-10) = 1, \quad f'(-7) = 2$$

Find $g'(-7)$.

Solution:

$$g'(-7) = \frac{1}{f'(g(-7))} = \frac{1}{f'(10)} = \frac{1}{-3}$$

20. Suppose f and g are differentiable functions where $g(x) = f^{-1}(x)$ for all x. Suppose further that

$$f(10) = -4, \quad f(-2) = 10, \quad f(2) = -2, \quad f(-4) = 2$$
$$f'(10) = -4, \quad f'(-2) = -1, \quad f'(2) = 9, \quad f'(-4) = 5$$

Find $g'(-2)$.

Solution:

$$g'(-2) = \frac{1}{f'(g(-2))} = \frac{1}{f'(2)} = \frac{1}{9}$$