

Differentiation Tables

Use the shared table to apply derivative rules and find each exact derivative value.

Each row gives function and derivative values at the displayed input. f and g are differentiable at every required input.

input	f	f'	g	g'
-5	5	4	4	6
-4	-9	0	2	-6
-1	-1	-4	-5	0
0	0	4	-1	1
2	7	2	0	-5
4	6	-3	-4	3

1.
$$h(x) = (f(x))^2$$

Find $h'(0)$.

2.
$$h(x) = (f(x))^2$$

Find $h'(-5)$.

3.
$$h(x) = (f(x))/(g(x))$$

Find $h'(0)$.

4.
$$h(x) = f(g(x))$$

Find $h'(-1)$.

5.
$$h(x) = -3f(x) + 5g(x)$$

Find $h'(-1)$.

6.
$$h(x) = f(x) - g(x)$$

Find $h'(-5)$.

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7.
$$h(x) = (5f(x))(-3g(x))$$

Find $h'(-1)$.

8.
$$h(x) = (f(x))(g(x))$$

Find $h'(2)$.

9.
$$h(x) = -3f(x) + 4g(x)$$

Find $h'(-4)$.

10.
$$h(x) = f(g(x))$$

Find $h'(0)$.

11.
$$h(x) = f(x) + g(x)$$

Find $h'(4)$.

12.
$$h(x) = (5f(x))/(-4g(x))$$

Find $h'(-4)$.

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Answer Key

Use the shared table to apply derivative rules and find each exact derivative value.

Each row gives function and derivative values at the displayed input. f and g are differentiable at every required input.

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1. $h(x) = (f(x))^2$; find $h'(0)$.

$$h' = 2ff'$$

At $x = 0$: $f = 0$, $f' = 4$, $g = -1$, $g' = 1$.

Substitute: $2(0)(4) = 0$.

$$h'(0) = 0$$

2. $h(x) = (f(x))^2$; find $h'(-5)$.

$$h' = 2ff'$$

At $x = -5$: $f = 5$, $f' = 4$, $g = 4$, $g' = 6$.

Substitute: $2(5)(4) = 40$.

$$h'(-5) = 40$$

3. $h(x) = (f(x))/(g(x))$; find $h'(0)$.

$$h' = (f'g - fg')/g^2$$

At $x = 0$: $f = 0$, $f' = 4$, $g = -1$, $g' = 1$.

Substitute: $((4)(-1) - (0)(1))/(-1)^2 = -4$.

At $x = 0$, $g(x) \neq 0$.

$$h'(0) = -4$$

4. $h(x) = f(g(x))$; find $h'(-1)$.

$$h' = f'(g(x))g'(x)$$

At $x = -1$: $f = -1$, $f' = -4$, $g = -5$, $g' = 0$.

Look up $g(-1) = -5$, then $f'(-5) = 4$ and $g'(-1) = 0$.

Multiply: $(4)(0) = 0$.

$$h'(-1) = 0$$

5. $h(x) = -3f(x) + 5g(x)$; find $h'(-1)$.

$$h' = Af' + Bg'$$

At $x = -1$: $f = -1$, $f' = -4$, $g = -5$, $g' = 0$.

Substitute: $(-3)(-4) + (5)(0) = 12$.

$$h'(-1) = 12$$

6. $h(x) = f(x) - g(x)$; find $h'(-5)$.

$$h' = f' - g'$$

At $x = -5$: $f = 5$, $f' = 4$, $g = 4$, $g' = 6$.

Substitute: $4 - (6) = -2$.

$$h'(-5) = -2$$

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2	7	2	0	-5
4	6	-3	-4	3

7. $h(x) = (5f(x))(-3g(x))$; find $h'(-1)$.

$$h' = (Af')(Bg) + (Af)(Bg')$$

At $x = -1$: $f = -1$, $f' = -4$, $g = -5$, $g' = 0$.

Substitute: $((5)(-4))((-3)(-5)) + ((5)(-1))((-3)(0)) = -300$.

$$h'(-1) = -300$$

8. $h(x) = (f(x))(g(x))$; find $h'(2)$.

$$h' = f'g + fg'$$

At $x = 2$: $f = 7$, $f' = 2$, $g = 0$, $g' = -5$.

Substitute: $(2)(0) + (7)(-5) = -35$.

$$h'(2) = -35$$

9. $h(x) = -3f(x) + 4g(x)$; find $h'(-4)$.

$$h' = Af' - Bg'$$

At $x = -4$: $f = -9$, $f' = 0$, $g = 2$, $g' = -6$.

Substitute: $(-3)(0) - (-4)(-6) = -24$.

$$h'(-4) = -24$$

10. $h(x) = f(g(x))$; find $h'(0)$.

$$h' = f'(g(x))g'(x)$$

At $x = 0$: $f = 0$, $f' = 4$, $g = -1$, $g' = 1$.

Look up $g(0) = -1$, then $f'(-1) = -4$ and $g'(0) = 1$.

Multiply: $(-4)(1) = -4$.

$$h'(0) = -4$$

11. $h(x) = f(x) + g(x)$; find $h'(4)$.

$$h' = f' + g'$$

At $x = 4$: $f = 6$, $f' = -3$, $g = -4$, $g' = 3$.

Substitute: $-3 + 3 = 0$.

$$h'(4) = 0$$

12. $h(x) = (5f(x))/(-4g(x))$; find $h'(-4)$.

$$h' = ((Af')(Bg) - (Af)(Bg'))/(Bg)^2$$

At $x = -4$: $f = -9$, $f' = 0$, $g = 2$, $g' = -6$.

Substitute: $((5)(0)((-4)(2)) - ((5)(-9))((-4)(-6)))/((-4)(2))^2 = 135/8$.

At $x = -4$, $(-4)g(x) \neq 0$.

$$h'(-4) = 135/8$$