

12.4 Practice

Find the derivative of each function.

1) $f(x) = 4x^2 - 3$

$$8x$$

2) $b(m) = 3m^{\frac{2}{3}} - 2m^{\frac{3}{2}}$

$$2m^{-1/3} - 3m^{1/2}$$
$$\frac{2}{\sqrt[3]{m}} - 3\sqrt{m}$$

3) $g(t) = -t^2 + 2t + 11$

$$-2t + 2$$

4) $n(t) = \frac{1}{t} + \frac{3}{t^2} + \frac{2}{t^3} + 4$

$$t^{-1} + 3t^{-2} + 2t^{-3} + 4$$

$$-1t^{-2} - 6t^{-3} - 6t^{-4}$$

$$-\frac{1}{t^2} - \frac{6}{t^3} - \frac{6}{t^4}$$

7) $v(n) = 5n^2 + 9n - 17$

$$10n + 9$$

5) $m(j) = 14j - 13$

$$14$$

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

$$\frac{3}{2}x^{-1/2} - \frac{3}{2}x^{1/2} - x^{-1/2}$$

$$\frac{3}{2\sqrt{x}} - \frac{3\sqrt{x}}{2} - \frac{1}{\sqrt{x}}$$

8) $q(c) = c^9 - 3c^5 + 5c^2 - 3c$

$$9c^8 - 15c^4 + 10c - 3$$

9) $h(c) = c^3 + 2c^2 - c + 5$

$$3c^2 + 4c - 1$$

10) $f(x) = -5x^3 - 9x^4 + 8x^5$

$$-15x^2 - 36x^3 + 40x^4$$

11) $r(b) = 2b^3 - 10b$

$$6b^2 - 10$$

12) $y(f) = -11f$

$$-11$$

13) $p(v) = 7v + 4$

$$7$$

14) $z(n) = 2n^2 + 7n$

$$4n + 7$$

15) $g(h) = 2h^{\frac{1}{2}} + 6h^{\frac{1}{3}} - 2h^{\frac{3}{2}}$

$$h^{-1/2} + 2h^{-2/3} - 3h^{1/2}$$

$$\frac{1}{\sqrt{h}} + \frac{2}{\sqrt[3]{h^2}} - 3\sqrt{h}$$

$$16) j(x) = (2x^2 + 6x)(2x^3 + 5x^2)$$

$$17) m(x) = (x^3 - 6x)(2 - 4x^3)$$

$$18) h(x) = \frac{4x^2}{x^3 + 3}$$

$$(4x + 6)(2x^3 + 5x^2) + (6x^2 + 10x)(2x^2 + 6x) = 8x^4 + 20x^3 + 12x^3 + 30x^2 + 12x^4 + 36x^3 + 20x^3 + 60x^2$$

$$20x^4 + 88x^3 + 90x^2$$

$$4x^5 + 10x^4 + 12x^4 + 30x^3 \frac{d}{dx}$$

$$20x^4 + 40x^3 + 48x^3 + 90x^2$$

$$20x^4 + 88x^3 + 90x^2$$

OR

match!

$$(3x^2 - 6)(2 - 4x^3) + (-12x^2)(x^3 - 6x) = 6x^2 - 12x^5 - 12 + 24x^3 - 12x^5 + 72x^3$$

$$-24x^5 + 96x^3 + 6x^2 - 12$$

$$\frac{8x(x^3 + 3) - 4x^2(3x^2)}{(x^3 + 3)^2}$$

$$8x^4 + 24x - 12x^4$$

$$\frac{4x^4 - 12x^4 + 24x}{(x^3 + 3)^2}$$

$$(x^3 + 3)^2$$

$$19) w(x) = \frac{3x + x^4}{2x^2 + 1}$$

$$20) t(x) = (4x^2 - x)(x^3 - 8x^2 + 12)$$

$$21) r(x) = \frac{\sqrt{x} + 2x}{7x - 4x^2}$$

$$\frac{(3 + 4x^3)(2x^2 + 1) - (3x + x^4)(4x)}{(2x^2 + 1)^2}$$

$$6x^2 + 3 + 8x^5 + 4x^3 - 12x^2 - 4x^5$$

$$(2x^2 + 1)^2$$

$$4x^5 + 4x^3 - 6x^2 + 3$$

$$(2x^2 + 1)^2$$

$$(8x - 1)(x^3 - 8x^2 + 12) + (3x^2 - 16x)(4x^2 - x)$$

$$8x^4 - 64x^3 + 96x^2 - 12x^3 + 8x^2 - 12 + 12x^4 + 3x^3 - 64x^3 + 16x^2$$

$$20x^4 - 132x^3 + 24x^2 + 96x - 12$$

$$\frac{(\frac{1}{2}x^{-1/2} + 2)(7x - 4x^2) - (7 - 8x)}{(7x - 4x^2)^2}$$

$$\frac{\frac{7}{2}x^{1/2} - 2x^{3/2} + 14x - 8x^2 - 7 + 8x}{(7x - 4x^2)^2}$$

$$(7x - 4x^2)^2$$

$$8x^2 - 2\sqrt{x^3} + 4.5\sqrt{x}$$

$$(7x - 4x^2)^2$$