

Mathé 42S – Exercices # 6A

A. Trouve la dérivée des fonctions suivantes.

Find the derivatives of the following functions

1) $y = 2x^{1/3}$ 2) $y = 5x^{11}$ 3) $y = \frac{1}{2}x^{-3/4}$ 4) $y = 7x^3 + 4x^2$

5) $y = 25x^{-1} + 12x^{1/2}$ 6) $y = \frac{3}{5}x^2 - 2x^8$ 7) $y = (x^3 + x)(x - 1)$

8) $y = (x + 1)(x^2 + 5x^{3/2})$ 9) $y = 3x^{3/4}$ 10) $y = 4x^{-2}$

11) $y = 4x^{2/3} + 5x^4 - x^3 + 3x$ 12) $y = (2x^2 - 1)(x^4 + 1)$ 13) $y = \frac{2x + 5}{x + 8}$

14) $y = \frac{2(\sqrt[3]{x}) - \sqrt[7]{x^4}}{x^2 + 3x + 1}$ 15) $y = \frac{1}{2x + 3}$ 16) $y = \frac{x^5}{x^{3/2} + x}$ 17) $y = \frac{x^2}{(x + 1)(x - 2)}$

18) $y = (\sqrt{x^5} + \sqrt[5]{x^6} - 12(\sqrt[3]{x^7})) (8x^9 - 19x^{-5})$

19) $y = \frac{\sqrt[4]{x+1} - \sqrt[5]{x^2}}{28x^2 + \sqrt{x}}$

B. Trouve la dérivée en sachant que a, b et c sont des constantes

Find the derivative assuming that a, b and c are constants.

1) $y = ax^2$ 2) $y = (ax + 3)(bx - 1)$ 3) $y = ax^3 + bx^2 + cx + d$

4) $y = a\sqrt{x} + b(\sqrt[3]{x}) + c^4$ 5) $y = \frac{2x^3 + a}{bx^2}$ 6) $y = b(\sqrt[4]{x+5})$

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$$1) y' = \frac{2}{3} x^{-2/3} \quad \left\{ \begin{array}{l} 2) y' = 55x^{10} \\ 3) y' = -\frac{3}{8} x^{-7/4} \end{array} \right.$$

$$4) y' = 21x^2 + 8x \quad \left\{ \begin{array}{l} 5) y' = -25x^{-2} + 6x^{-1/2} \\ 6) y' = \frac{6}{5}x - 16x^7 \end{array} \right.$$

$$7) y' = (3x^2 + 1)(x-1) + x^3 + x \quad 8) y' = x^2 + 5x^{3/2} + (2x + \frac{15}{2}x^{1/2})(x+1)$$

$$9) y' = \frac{9}{4}x^{-1/4} \quad \left\{ \begin{array}{l} 10) y' = -8x^{-3} \\ 11) y' = \frac{8}{3}x^{-1/3} + 20x^3 - 3x^2 + 3 \end{array} \right.$$

$$12) y' = 4x(x^4+1) + 4x^3(2x^2-1) \quad \left\{ \begin{array}{l} 13) y' = \frac{2(x+8) - 1(2x+5)}{(x+8)^2} \end{array} \right.$$

$$14) y' = \frac{(\frac{2}{5}x^{-4/5} - \frac{4}{7}x^{-3/7})(x^2+3x+1) - (2x+3)(\frac{1}{5}x^{-4/5} - x^{4/7})}{(x^2+3x+1)^2}$$

$$15) y' = \frac{-2}{(2x+3)^2} \quad \left\{ \begin{array}{l} 16) y' = \frac{5x^4(x^{3/2}+x) - (\frac{3}{2}x^{1/2}+1)x^5}{(x^{3/2}+x)^2} \end{array} \right.$$

$$17) y' = \frac{2x(x+1)(x-2) - [(x-2) + (x+1)]x^2}{(x+1)^2(x-2)^2}$$

$$18) y' = (\frac{5}{2}x^{3/2} + \frac{6}{5}x^{1/5} - 28x^{4/3})(8x^9 - 19x^{-5}) + (72x^8 + 95x^{-6})(x^{5/2} + x^{6/5} - 12x^{7/3})$$

$$19) y' = \frac{(\frac{1}{4}(x+1)^{-3/4} - \frac{2}{5}x^{-3/5})(28x^2 + x^{1/2}) - (56x + \frac{1}{2}x^{-1/2})(\frac{1}{4}(x+1)^{1/4} - x^{2/5})}{(28x^2 + \sqrt{x})^2}$$

B) 1) $y' = 2ax$ 2) $y' = a(bx-1) + b(ax+3)$ 3) $y' = 3ax^2 + 2bx + c$

4) $y' = \frac{1}{2}ax^{-1/2} + \frac{1}{3}bx^{-2/3}$ 5) $\frac{6x^2(bx^2) - 2bx(2x^3+a)}{b^2x^4}$

6) $y' = \frac{1}{4}b-(x+5)^{-3/4}$