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01/05/2021

1.  $F(x) = 5$

$$F'(x) = 0$$

2.  $F(x) = -2x$

$$F'(x) = -2 \cdot 1$$

$$F'(x) = -2$$

3.  $F(x) = -2x + 2$

$$F'(x) = -2 \cdot 1 + 0$$

$$F'(x) = -2$$

4.  $F(x) = -2x^2 - 5$

$$F'(x) = 2 \cdot -2x^{2-1} - 0$$

$$F'(x) = -4x$$

5.  $F(x) = 2x^4 + x^3 - x^2 + 4$

$$F'(x) = 4 \cdot 2x^{4-1} + 3 \cdot x^{3-1} - 2 \cdot x^{2-1} + 0$$

$$F'(x) = 8x^3 + 3x^2 - 2x$$

6.  $F(x) = \frac{x^3 + 2}{3}$

$$F'(x) = 3 \cdot \frac{d}{dx} \frac{x^3 + 2}{3} = \frac{d}{dx} (x^3 + 2)$$

$$F'(x) = \frac{3 \cdot 3x^2 - x^3 + 2 \cdot 0}{3^2}$$

$$F'(x) = \frac{9x^2}{3^2}$$

7.  $F(x) = \frac{1}{3x^2}$

$$F(x) = 1 \cdot 3x^{-2}$$

$$F(x) = 3x^{-2}$$

$$F'(x) = -2 \cdot 3x^{-2-1}$$

$$F'(x) = -6x^{-3}$$

$$F'(x) = \frac{-6}{x^3}$$

8.  $F(x) = \frac{x+1}{x-1}$

$$F'(x) = \frac{(x-1) \frac{d}{dx} (x+1) - (x+1) \frac{d}{dx} (x-1)}{(x-1)^2}$$

$$F'(x) = \frac{(x-1)(1) - (x+1)(1)}{(x-1)^2}$$

$$F'(x) = \frac{x-1 - x-1}{(x-1)^2}$$

$$F'(x) = \frac{-2}{(x-1)^2}$$

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9.-  $F(x) = (5x^2 - 3) \cdot (x^2 + x + 4)$

$$F(x) = 5x^4 + 5x^3 + 20x^2 - 3x^2 - 3x - 12$$

$$F(x) = 5x^4 + 5x^3 + 17x^2 - 3x - 12$$

$$F'(x) = 20x^3 + 15x^2 + 34x - 3$$

10.-  $F(x) = \frac{5}{x^5}$

$$F(x) = 5 \cdot x^{-5}$$

$$F(x) = 5x^{-5}$$

$$F'(x) = -25x^{-6}$$

$$F'(x) = \frac{-25}{x^6}$$

11.-  $F(x) = \frac{5}{x^5} + \frac{3}{x^2}$

$$F(x) = 5 \cdot x^{-5} + 3 \cdot x^{-2}$$

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

$$F'(x) = -25x^{-6} - 6x^{-3}$$

$$F'(x) = \frac{-25}{x^6} + \frac{-6}{x^3}$$

12.-  $F(x) = \sqrt{x}$

$$F(x) = x^{1/2}$$

$$F'(x) = \frac{1}{2} \cdot x^{1/2 - 1}$$

$$F'(x) = \frac{1}{2} x^{-1/2}$$

$$F'(x) = \frac{1}{2} \cdot \frac{1}{x^{1/2}}$$

$$F'(x) = \frac{1}{2x^{1/2}} = \frac{1}{2\sqrt{x}}$$

13.-  $F(x) = \frac{1}{\sqrt{x}} = \frac{1}{x^{1/2}}$

$$F(x) = x^{-1/2}$$

$$F'(x) = -\frac{1}{2} \cdot x^{-1/2 - 1}$$

$$F'(x) = -\frac{1}{2} x^{-3/2}$$

$$F'(x) = -\frac{1}{2} \cdot \frac{1}{x^{3/2}}$$

$$F'(x) = -\frac{1}{2x^{3/2}} = -\frac{1}{2\sqrt{x^3}}$$

14.-  $F(x) = \frac{1}{x \cdot \sqrt{x}}$

$$F(x) = \frac{1}{x \cdot x^{1/2}}$$

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

$$F(x) = x^{-3/2}$$

$$F'(x) = -\frac{3}{2} \cdot x^{-3/2 - 1}$$

$$F'(x) = -\frac{3}{2} x^{-5/2}$$

$$F'(x) = -\frac{3}{2x^{5/2}}$$

$$F'(x) = -\frac{3}{2\sqrt{x^5}}$$

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$$15. - F(x) = \sqrt[3]{x^2} + \sqrt{x}$$

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

$$F'(x) = \frac{2}{3} \cdot x^{2/3-1} + \frac{1}{2} \cdot x^{1/2-1}$$

$$F'(x) = \frac{2}{3} x^{-1/3} + \frac{1}{2} x^{-1/2}$$

$$F'(x) = \frac{2}{3x^{1/3}} + \frac{1}{2x^{1/2}}$$

$$F'(x) = \frac{2}{3\sqrt[3]{x}} + \frac{1}{2\sqrt{x}}$$

$$16. F(x) = (x^2 + 3x - 2)^4$$

$$F'(x) = 4 \cdot (x^2 + 3x - 2)^{4-1} \cdot (2 \cdot x^{2-1} + 3 \cdot 1 - 0)$$

$$F'(x) = 4(x^2 + 3x - 2)^3 \cdot (2x + 3)$$

$$F'(x) = (x^2 + 3x - 2)^3 (8x + 12)$$

$$17. F(x) = \sqrt{x^2 - 2x + 3}$$

$$F(x) = (x^2 - 2x + 3)^{1/2}$$

$$F'(x) = \frac{1}{2} \cdot (x^2 - 2x + 3)^{1/2-1} \cdot (2 \cdot x^{2-1} - 2 \cdot 1 + 0)$$

$$F'(x) = \frac{1}{2} (x^2 - 2x + 3)^{-1/2} \cdot (2x - 2)$$

$$F'(x) = \frac{2x - 2}{2 \cdot (x^2 - 2x + 3)^{1/2}}$$

$$F'(x) = \frac{x - 1}{\sqrt{x^2 - 2x + 3}}$$

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$$18. - F(x) = \sqrt[4]{x^5 - x^3 - 2}$$

$$F(x) = (x^5 - x^3 - 2)^{1/4}$$

$$F'(x) = \frac{1}{4} \cdot (x^5 - x^3 - 2)^{1/4 - 1} \cdot (5 \cdot x^{5-1} + 3 \cdot -x^{3-1} - 0)$$

$$F'(x) = \frac{1}{4} (x^5 - x^3 - 2)^{-3/4} \cdot (5x^4 - 3x^2)$$

$$F'(x) = \frac{5x^4 - 3x^2}{4 \cdot (x^5 - x^3 - 2)^{3/4}}$$

$$F'(x) = \frac{5x^4 - 3x^2}{4 \sqrt[4]{(x^5 - x^3 - 2)^3}}$$