

24.02.2010г.

*Дифференцирование частного
и степени.*

Дернова А.М.

учитель математики I кв.к.

МБОУ «Новотроицкая СОШ»

Проверка домашней работы

- № 208 а, в

$$а) f(x) = x^2 + x^3,$$

$$f'(x) = (x^2 + x^3)' = (x^2)' + (x^3)' = 2x + 3x^2 = 3x^2 + 2x.$$

$$в) f(x) = x^2 + 3x - 1,$$

$$f'(x) = (x^2 + 3x - 1)' = (x^2)' + (3x)' - 1' = 2x + 3.$$

№ 2096

$$f(x) = \sqrt{x}(2x^2 - x),$$

$$f'(x) = (\sqrt{x})'(2x^2 - x) + \sqrt{x}(2x^2 - x)' =$$

$$= \left(x^{\frac{1}{2}}\right)'(2x^2 - x) + \sqrt{x}\left((2x^2)' - (x)'\right) = \frac{1}{2}x^{-\frac{1}{2}}(2x^2 - x) + \sqrt{x}(2 \cdot 2x - 1) =$$

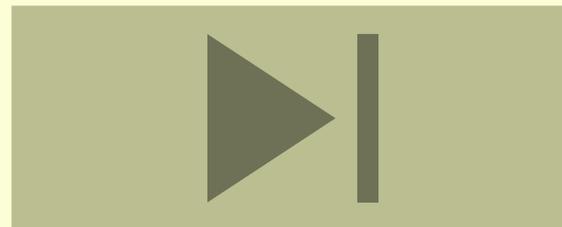
$$= x^{\frac{3}{2}} - \frac{1}{2}x^{\frac{1}{2}} + 4x^{\frac{3}{2}} - x^{\frac{1}{2}} = 5x\sqrt{x} - \frac{3}{2}\sqrt{x} = \frac{10x\sqrt{x} - 3\sqrt{x}}{2} = \frac{10x^2 - 3x}{2\sqrt{x}}$$

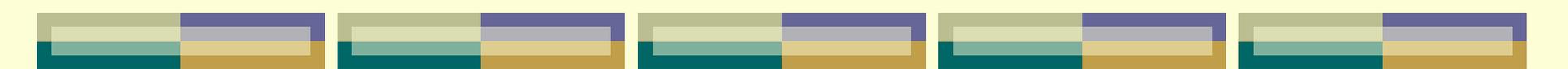
Устно



Решение упражнений

- *Самостоятельно с последующей проверкой*
- *№ 209в*
- *№ 209г*



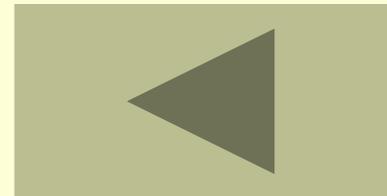

$$f(x) = x^2(3x + x^3)$$

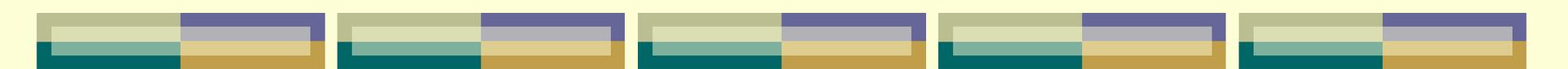
$$I: f(x) = x^2(3x + x^3) = 3x^3 + x^5$$

$$\begin{aligned} f'(x) &= (3x^3 + x^5)' = (3x^3)' + (x^5)' = 3 \cdot (x^3)' + 5 \cdot x^{5-1} = \\ &= 3 \cdot 3 \cdot x^{3-1} + 5x^4 = 9x^2 + 5x^4 = 5x^4 + 9x^2. \end{aligned}$$

$$II: (uv)' = u'v + uv', u = x^2, v = 3x + x^3$$

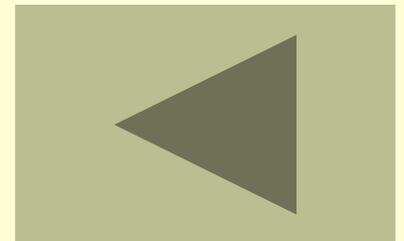
$$\begin{aligned} f'(x) &= (x^2)' \cdot (3x + x^3) + x^2 \cdot (3x + x^3)' = \\ &= 2x^{2-1} \cdot (3x + x^3) + x^2 \cdot (3 \cdot x^{1-1} + 3 \cdot x^{3-1}) = \\ &= 2x \cdot 3x + 2x \cdot x^3 + x^2 \cdot 3 \cdot x^0 + x^2 \cdot 3x^2 = \\ &= 6x^2 + 2x^4 + 3x^2 + 3x^4 = 5x^4 + 9x^2. \end{aligned}$$

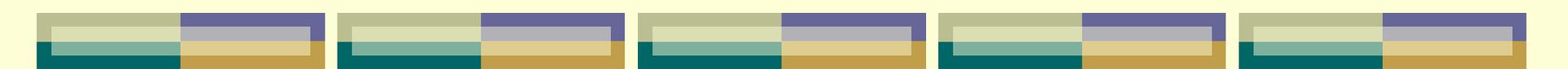



$$f(x) = (2x - 3)(1 - x^3)$$

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

$$\begin{aligned} f'(x) &= (2x - 2x^4 - 3 + 3x^3)' = (2x)' - (2x^4)' - (3)' + (3x^3)' = \\ &= 2 - 8x^3 - 0 + 9x^2 = -8x^3 + 9x^2 + 2. \end{aligned}$$





Найдите производные функций:

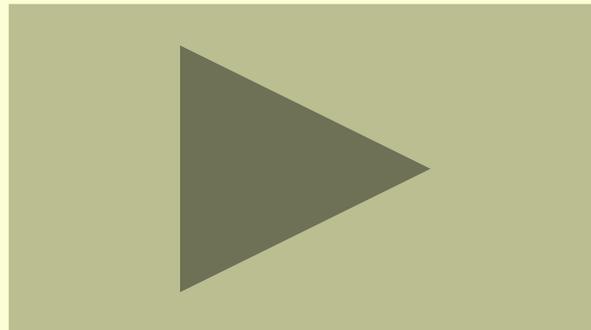
$$a) f(x) = \frac{x}{x+4};$$

$$б) f(x) = \frac{x^2}{x-1};$$

$$в) f(x) = \frac{x^3 - 2}{x^2 + 4}.$$


Решение из учебника

- *№ 210б*
- *Самостоятельно, с последующей проверкой*
- *№ 210 в*
- *№ 210 г*



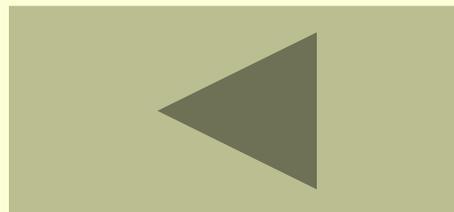
№ 210 в

$$y = \frac{3x-2}{5x+8}$$

$$y' = \left(\frac{3x-2}{5x+8}\right)' = \frac{(3x-2)'(5x+8) - (3x-2)(5x+8)'}{(5x+8)^2} =$$

$$= \frac{3 \cdot (5x+8) - (3x-2) \cdot 5}{(5x+8)^2} = \frac{15x+24-15x+10}{(5x+8)^2} =$$

$$= \frac{34}{(5x+8)^2}.$$



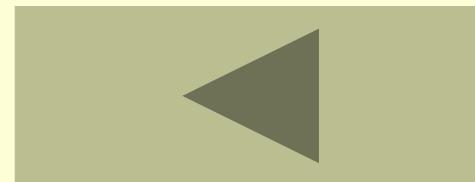
№ 210 z

$$y = \frac{3 - 4x}{x^2}$$

$$y' = \left(\frac{3 - 4x}{x^2} \right)' = \frac{(3 - 4x)' \cdot x^2 - (3 - 4x) \cdot (x^2)'}{(x^2)^2} =$$

$$= \frac{-4x^2 - (3 - 4x) \cdot 2x}{x^4} = \frac{-4x^2 - 6x + 8x^2}{x^4} =$$

$$= \frac{4x^2 - 6x}{x^4} = \frac{4x - 6}{x^3}$$





Дома

- *п. 14 (учить формулы)*
 - *№ 210 а*
 - *№ 211 а, б, в*
- 