Тренажёр №1 Найдите производную функции:

Вариант 1	**Вариант 2**	**Вариант 3**	**Вариант 4**	**Вариант 5**
1) $y = x^5 - 8x$	1) $y = x^6 - 7x$	1) $y = 7x + x^4$	1) $y = x^7 - 13x$	1) $y = -8x + x^{12}$
2) $y = 2x^8 + 8x^3 - 5$	2) $y = 6x^4 + 9x^3 - 10$	2) $y = 3x^7 + 10x^2 - 13$	2) $y = 6x^3 + 2x^5 - 9$	2) $y = 9x^2 + 5x^4 + 15$
3) $y = 13x - \sqrt{x}$	3) $y = \sqrt{x} - 15x$	3) $y = 4x + \sqrt{x}$	3) $y = 3x - \sqrt{x}$	3) $y = 9x - 3\sqrt{x}$
4) $y = \frac{1}{x} + 6x^{-4} + 3$	4) $y = 5x^{-2} - \frac{1}{x} + 9$	4) $y = \frac{1}{x} + 3x^3 - 35$	4) $y = 5 - \frac{1}{x} + 5x^{-4}$	4) $y = \frac{1}{x} - 7x^{-4} + 10$
5) $y = -\frac{5}{x^3} - \sin x$	5) $y = \frac{4}{x^5} - tgx$	5) $y = -\frac{6}{x^8} - ctgx$	5) $y = \frac{10}{x^3} - 4\cos x$	5) $y = -\frac{2}{x^4} - 3\sin x$
6) $y = \cos x + \sqrt{x}$	6) $y = 5\sin x + \sqrt{x}$	6) $y = \sqrt{x} - 3\cos x$	6) $y = ctgx + \sqrt{x}$	6) $y = tgx + \sqrt{x}$
7) $y = \frac{2}{x^{-6}} - 3tgx$	7) $y = \frac{6}{x^{-3}} - \cos x$	7) $y = -\frac{4}{x^5} - \sin x$	7) $y = \frac{8}{x^{-3}} - 2\sin x$	7) $y = \frac{5}{x^{-6}} + ctgx$
8) $y = (x^3 - 4)(2 + x^4)$	8) $y = (x^6 + 3)(x^4 - 4)$	8) $y = (x^9 - 1)(10 + x^2)$	8) $y = (x^2 - 5)(x^4 - 3)$	8) $y = (x^4 + 7)(1 + x^5)$
9) $y = \sqrt{x}(5x - 3)$	9) $y = \sqrt{x}(6x - 1)$	9) $y = \sqrt{x}(3x - 4)$	9) $y = \sqrt{x}(2x - 5)$	9) $y = \sqrt{x}(3 - 4x)$
10) $y = x^5 \sin x$	10) $y = x^6 \cos x$	10) $y = x^4 \sin x$	10) $y = x^7 tgx$	10) $y = x^8 \cos x$
11) $y = \left(\frac{5}{x} - 2\right)(4x + 2)$	11) $y = \left(\frac{3}{x} - 4\right)(3x + 6)$	11) $y = \left(\frac{2}{x} - 5\right)(3x + 7)$	11) $y = \left(\frac{4}{x} + 1\right)(3x + 9)$	11) $y = \left(\frac{6}{x} - 7\right)(x + 2)$
12) $y = \frac{2x^6}{3x - 8}$	12) $y = \frac{4x^5}{2x + 5}$	12) $y = \frac{5x^3}{2x - 7}$	12) $y = \frac{3x^6}{2x - 1}$	12) $y = \frac{8x^3}{2x - 9}$
13) $y = \frac{3\sqrt{x}}{x^4 - 5}$	13) $y = \frac{9\sqrt{x}}{6 + 2x^5}$	13) $y = \frac{-2\sqrt{x}}{x^6 - 2}$	13) $y = \frac{5\sqrt{x}}{x^5 + 2}$	13) $y = \frac{4\sqrt{x}}{x^3 + 5}$
14) $y = \frac{ctgx}{6x}$	14) $y = \frac{4x}{ctgx}$	14) $y = \frac{tgx}{2x^2}$	14) $y = \frac{2\cos x}{7x}$	14) $y = \frac{\sin x}{4x^3}$

Вариант 6	**Вариант 7**	**Вариант 8**	**Вариант 9**	**Вариант 10**
1) $y = x^2 - 6x$	1) $y = 4x - 7x^6$	1) $y = 10x + x^{16}$	1) $y = x^{13} - 5x$	1) $y = -9x + x^{10}$
2) $y = 3x^8 + 8x^3 - 9$	2) $y = x^4 + 9x^5 - 16$	2) $y = 9x^2 + 3x^4 - 14$	2) $y = 12x^3 + 6x^2 - 42$	2) $y = -2x^2 + 4x^4 + 11$
3) $y = 12x + 2\sqrt{x}$	3) $y = 5\sqrt{x} - 12x$	3) $y = -8x + \sqrt{x}$	3) $y = 10x - 2\sqrt{x}$	3) $y = 6x + \sqrt{x}$
4) $y = \frac{1}{x} + 5x^{-4} - 16$	4) $y = 9x^{-2} - \frac{1}{x} - 14$	4) $y = \frac{1}{x} + 15x^3 - 5$	4) $y = 3 - \frac{1}{x} + 4x^{-5}$	4) $y = \frac{1}{x} - 5x^{-4} + 9$
5) $y = \frac{8}{x^4} - 4\sin x$	5) $y = \frac{7}{x^5} - ctgx$	5) $y = -\frac{3}{x^8} - tgx$	5) $y = \frac{5}{x^3} - 3\cos x$	5) $y = -\frac{4}{x^4} - 5\sin x$
6) $y = \cos x + 2\sqrt{x}$	6) $y = 3\sin x + \sqrt{x}$	6) $y = 5\sqrt{x} - \cos x$	6) $y = ctgx + 6\sqrt{x}$	6) $y = tgx + 2\sqrt{x}$
7) $y = -\frac{5}{x^{-6}} + tgx$	7) $y = \frac{7}{x^{-3}} + \sin x$	7) $y = -\frac{2}{x^5} - 4\sin x$	7) $y = \frac{2}{x^{-3}} + 5\sin x$	7) $y = \frac{4}{x^{-7}} + ctgx$
8) $y = (x^3 - 6)(2 + x^6)$	8) $y = (x^9 + 3)(x^2 - 4)$	8) $y = (x^3 - 1)(12 + x^2)$	8) $y = (x^2 + 4)(8 - x^4)$	8) $y = (x^8 + 1)(2 + x^2)$
9) $y = \sqrt{x}(4x - 4)$	9) $y = \sqrt{x}(12x - 1)$	9) $y = \sqrt{x}(2x + 8)$	9) $y = \sqrt{x}(5x - 1)$	9) $y = \sqrt{x}(4 - 3x)$
10) $y = x^9 \sin x$	10) $y = x^8 \cos x$	10) $y = x^{11} tgx$	10) $y = x^9 ctgx$	10) $y = x^3 \cos x$
11) $y = \left(\frac{9}{x} - 1\right)(5x + 2)$	11) $y = \left(\frac{6}{x} - 1\right)(2x + 6)$	11) $y = \left(\frac{3}{x} + 5\right)(3x + 8)$	11) $y = \left(\frac{2}{x} + 3\right)(5x + 7)$	11) $y = \left(\frac{5}{x} - 3\right)(x - 2)$
12) $y = \frac{3x^6}{2x - 5}$	12) $y = \frac{4x^6}{8x + 5}$	12) $y = \frac{4x^3}{3x - 9}$	12) $y = \frac{2x^7}{4x - 5}$	12) $y = \frac{6x^3}{3x - 8}$
13) $y = \frac{9\sqrt{x}}{x^5 - 6}$	13) $y = \frac{4\sqrt{x}}{10 + x^5}$	13) $y = \frac{5\sqrt{x}}{x^7 - 1}$	13) $y = \frac{2\sqrt{x}}{x^3 + 6}$	13) $y = \frac{\sqrt{x}}{x^6 + 3}$
14) $y = \frac{ctgx}{4x^3}$	14) $y = \frac{7x}{tgx}$	14) $y = \frac{ctgx}{6x^2}$	14) $y = \frac{2tgx}{9x}$	14) $y = \frac{2\sin x}{x^3}$

Тренажёр №2
Найдите производную сложной функции:

Вариант 1	***Вариант 2***	***Вариант 3***	***Вариант 4***	***Вариант 5***
$1)\ y=(5x+6)^4$	$1)\ y=(4x+3)^5$	$1)\ y=(3x+4)^3$	$1)\ y=(2x+5)^4$	$1)\ y=(6x+7)^9$
$2)\ y=(2-7x^2+3x)^3$	$2)\ y=(7-6x^2+2x)^4$	$2)\ y=(8-5x^2+4x)^5$	$2)\ y=(6-3x^2+5x)^6$	$2)\ y=(5-4x^2+9x)^3$
$3)\ y=4(2x-9)^2$	$3)\ y=3(8x-1)^3$	$3)\ y=2(4x-3)^2$	$3)\ y=5(6x-8)^5$	$3)\ y=8(3x-2)^4$
$4)\ y=\frac{1}{(3x+5)^3}$	$4)\ y=\frac{1}{(7x+2)^4}$	$4)\ y=\frac{1}{(5x+3)^2}$	$4)\ y=\frac{1}{(4x+6)^3}$	$4)\ y=\frac{1}{(2x+4)^5}$
$5)\ y=\frac{5}{(6-4x)^5}$	$5)\ y=\frac{3}{(8-5x)^6}$	$5)\ y=\frac{5}{(7-6x)^4}$	$5)\ y=\frac{6}{(5-3x)^7}$	$5)\ y=\frac{4}{(3-7x)^5}$
$6)\ y=2\sqrt{6x+2}$	$6)\ y=3\sqrt{4x+9}$	$6)\ y=4\sqrt{2x+7}$	$6)\ y=8\sqrt{3x+4}$	$6)\ y=6\sqrt{5x+3}$
$7)\ y=\sqrt{\frac{x}{4}-12}$	$7)\ y=\sqrt{\frac{x}{3}-13}$	$7)\ y=\sqrt{\frac{x}{5}-11}$	$7)\ y=\sqrt{\frac{x}{2}-10}$	$7)\ y=\sqrt{\frac{x}{9}-14}$
$8)\ y=\sin\left(6x-\frac{\pi}{3}\right)$	$8)\ y=\sin\left(7x-\frac{\pi}{4}\right)$	$8)\ y=\sin\left(5x-\frac{\pi}{6}\right)$	$8)\ y=\sin\left(4x-\frac{\pi}{5}\right)$	$8)\ y=\sin\left(8x-\frac{\pi}{2}\right)$
$9)\ y=4\cos(2x+\pi)$	$9)\ y=2\cos(3x+\pi)$	$9)\ y=3\cos(4x+2\pi)$	$9)\ y=9\cos(5x+\pi)$	$9)\ y=6\cos(7x+\pi)$
$10)\ y=tg\left(3x-\frac{\pi}{4}\right)$	$10)\ y=tg\left(5x-\frac{\pi}{3}\right)$	$10)\ y=tg\left(4x-\frac{\pi}{5}\right)$	$10)\ y=tg\left(2x-\frac{\pi}{6}\right)$	$10)\ y=tg\left(4x-\frac{\pi}{3}\right)$
$11)\ y=4ctg\left(\frac{x}{2}+\frac{\pi}{6}\right)$	$11)\ y=6ctg\left(\frac{x}{3}+\frac{\pi}{2}\right)$	$11)\ y=3ctg\left(\frac{x}{6}+\frac{\pi}{3}\right)$	$11)\ y=5ctg\left(\frac{x}{4}+\frac{\pi}{2}\right)$	$11)\ y=2ctg\left(\frac{x}{5}+\frac{\pi}{4}\right)$
$12)\ y=5\sin^3\left(3x+\frac{\pi}{2}\right)$	$12)\ y=4\sin^2\left(2x+\frac{\pi}{6}\right)$	$12)\ y=8\sin^4\left(4x+\frac{\pi}{2}\right)$	$12)\ y=7\sin^3\left(5x+\frac{\pi}{4}\right)$	$12)\ y=6\sin^3\left(8x+\frac{\pi}{5}\right)$
Вариант 6	***Вариант 7***	***Вариант 8***	***Вариант 9***	***Вариант 10***
$1)\ y=(2x+13)^5$	$1)\ y=(14x+2)^6$	$1)\ y=(4x+3)^3$	$1)\ y=(5x+2)^4$	$1)\ y=(7x+1)^8$
$2)\ y=(11-5x^2+4x)^2$	$2)\ y=(17-5x^2+6x)^4$	$2)\ y=(5-9x^2+8x)^5$	$2)\ y=(3-6x^2+4x)^6$	$2)\ y=(1-3x^2+4x)^5$
$3)\ y=11(3x-9)^4$	$3)\ y=16(2x-7)^3$	$3)\ y=4(3x-5)^2$	$3)\ y=6(5x-4)^5$	$3)\ y=7(5x-4)^6$
$4)\ y=\frac{1}{(4x+6)^3}$	$4)\ y=\frac{1}{(9x+1)^4}$	$4)\ y=\frac{1}{(6x+2)^2}$	$4)\ y=\frac{1}{(3x+7)^3}$	$4)\ y=\frac{1}{(6x+2)^5}$
$5)\ y=\frac{5}{(10-5x)^6}$	$5)\ y=\frac{3}{(3-4x)^6}$	$5)\ y=\frac{17}{(10-2x)^4}$	$5)\ y=\frac{16}{(3-5x)^7}$	$5)\ y=\frac{14}{(4-5x)^5}$
$6)\ y=8\sqrt{15x+3}$	$6)\ y=2\sqrt{7x+11}$	$6)\ y=11\sqrt{3x+9}$	$6)\ y=3\sqrt{4x+8}$	$6)\ y=3\sqrt{4x+6}$
$7)\ y=\sqrt{\frac{x}{8}-16}$	$7)\ y=\sqrt{\frac{x}{2}-3}$	$7)\ y=\sqrt{\frac{x}{4}-1}$	$7)\ y=\sqrt{\frac{x}{3}-9}$	$7)\ y=\sqrt{\frac{x}{6}-9}$
$8)\ y=\sin\left(9x-\frac{\pi}{3}\right)$	$8)\ y=\sin\left(6x-\frac{\pi}{4}\right)$	$8)\ y=\sin\left(8x-\frac{\pi}{2}\right)$	$8)\ y=\sin\left(7x-\frac{\pi}{6}\right)$	$8)\ y=\sin\left(5x-\frac{\pi}{3}\right)$
$9)\ y=7\cos(5x+\pi)$	$9)\ y=6\cos(2x+\pi)$	$9)\ y=4\cos(4x+2\pi)$	$9)\ y=8\cos(5x+\pi)$	$9)\ y=2\cos(3x+\pi)$
$10)\ y=tg\left(4x-\frac{\pi}{4}\right)$	$10)\ y=tg\left(9x-\frac{\pi}{3}\right)$	$10)\ y=tg\left(8x-\frac{\pi}{9}\right)$	$10)\ y=tg\left(5x-\frac{\pi}{6}\right)$	$10)\ y=tg\left(2x-\frac{\pi}{6}\right)$
$11)\ y=3ctg\left(\frac{x}{3}+\frac{\pi}{6}\right)$	$11)\ y=7ctg\left(\frac{x}{5}+\frac{\pi}{2}\right)$	$11)\ y=2ctg\left(\frac{x}{7}+\frac{\pi}{3}\right)$	$11)\ y=3ctg\left(\frac{x}{6}+\frac{\pi}{2}\right)$	$11)\ y=4ctg\left(\frac{x}{2}+\frac{\pi}{4}\right)$
$12)\ y=6\sin^3\left(4x+\frac{\pi}{5}\right)$	$12)\ y=3\sin^2\left(4x+\frac{\pi}{6}\right)$	$12)\ y=4\sin^4\left(5x+\frac{\pi}{6}\right)$	$12)\ y=2\sin^3\left(3x+\frac{\pi}{4}\right)$	$12)\ y=7\sin^3\left(2x+\frac{\pi}{7}\right)$