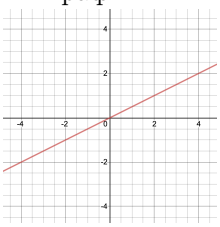
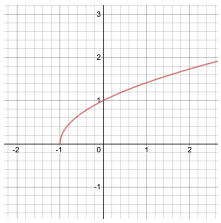
ЗАЧЕТ

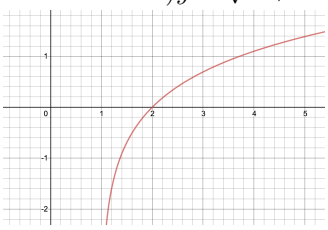
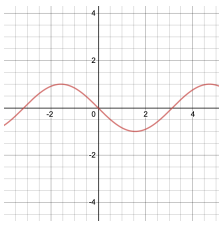
1 Теория

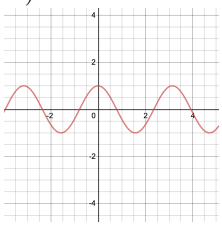
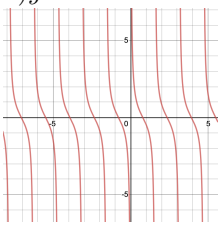
1)Числовая функция- функция, которая действует из одного числового пространства (множества) в другое числовое пространство (множество).
Пример:

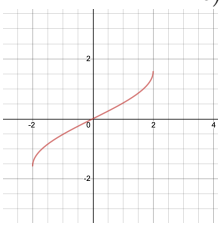
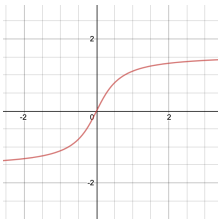
2 Практика

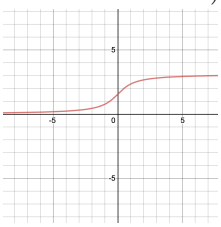
1)Построить графики.

а)$y = \frac{1}{2}x$  б)$y = \sqrt{x+1}$ 

в)$y = ln(x-1)$  г)$y = -sinx$ 

д)$y = cos2x$  е)$y = ctg2x$ 

ё)$y = arcsin\frac{x}{2}$  ж)$y = arctg2x$ 

и)$y = arcctg(-x)$ 

2)$\lim \frac{n(2-n)}{5+3n+2n^2} = \lim \frac{2n-n^2}{5+3n+2n^2} = \lim \frac{2-2n}{3+4n} = \lim \frac{2}{4} - \frac{1}{2}$

3)$\lim \frac{\sqrt{n^3}-1}{n(n-3)} = \lim \frac{n^{\frac{3}{2}}-1}{n^2-3n} = \lim \frac{\frac{3}{2}n^{\frac{1}{2}}}{2n-3} = \lim \frac{\frac{3}{4}b^{-\frac{1}{2}}}{2} = \lim \frac{3}{8b^{\frac{1}{2}}} = 0$

4)$\lim \frac{n^2}{\sqrt{n^3+1}} = \lim \frac{2}{\frac{1}{2}(n^3+1)^{-\frac{1}{2}}(3n)} = \lim \frac{4\sqrt{n^3+1}}{3n} = +\infty$

5) $\lim\limits_{x\to -2} \frac{4-x^2}{x^2+x-2} = \lim\limits_{x\to -2} \frac{-2x}{2x+1} = -\frac{4}{3}$

6) $\lim\limits_{x\to \frac{\pi}{2}} \frac{x}{cosx} = \frac{\frac{\pi}{2}}{0} = \infty$

7) $\lim\limits_{x\to 1} \frac{x^2-1}{(x-1)^2} = \lim\limits_{x\to 1} \frac{(x+1)}{(x-1)} = \infty$

8) $\lim\limits_{x\to 0} \frac{sin3x}{x-2x^2} = \lim\limits_{x\to 0} \frac{3x}{x-2x^2} \lim\limits_{x\to 0} \frac{3}{1-4x} = \lim\limits_{x\to 0} \frac{3}{1} = 3$

9) $\lim\limits_{x\to 0} xctg2x = \lim\limits_{x\to 0} \frac{x}{tg2x} = \lim\limits_{x\to 0} \frac{1}{2} = \frac{1}{2}$

10) $\lim\limits_{x\to \infty} \frac{x-3x^2}{2x^2-1} = \lim\limits_{x\to \infty} \frac{\frac{1}{x}-3}{2-\frac{1}{x^2}} = -\frac{3}{2}$

11)11

12)Найдите приращение функции $y = \sqrt{1+x^2}$ в точке $x = 0$, если $\Delta x = -\frac{3}{4}$.

$\Delta y = f(x_0 + \Delta x) - f(x_0)$

$\Delta y = \sqrt{1+(0-\frac{3}{4})^2} - \sqrt{1+0^2}$

$\Delta y = \frac{5}{4} - 1 = \frac{1}{4}$

13)

14)

15)$f(x) = x^4 + x$. $\lim\limits_{\Delta x\to 0} \frac{f(-1+\Delta x)-f(-1)}{\Delta x}$

$f'(x) = 4x^3 + 1$

$f'(-1) = 4(-1^3) + 1 = -3$
16)
17)
18)$y = x^2\sqrt{1-x^2}$.
$y' = 2x\sqrt{1-x^2} + \frac{2x^3}{2\sqrt{1-x^2}} = \frac{4x^2(1-x^2)+2x^3}{2x\sqrt{1-x^2}} =$