MATH 10A with Prof. Stankova
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Discussion on Sets and Functions

1. Graph the following functions
   - $f(x) = \arctan x$
   - $f(x) = \arccos x$
   - $f(x) = \arcsin x$
2. Find the inverse of the function
   - $f(x) = 1 + \sqrt{2 + 3x}$
   - $f(x) = e^{2x-1}$
   - $y = x^2 - x$ for $x \geq \frac{1}{2}$
3. Simplify the following expression
   - $\log_3 100 - \log_3 18 - \log_3 50$
   - $\ln(a + b) + \ln(a - b) - 2 \ln c$
   - $\frac{1}{3} \ln (x + 2)^3 + \frac{1}{2}[\ln x - \ln (x^2 + 3x + 2)^2]$
4. Find the limit of the following sequences
   - $a_n = \frac{10^n}{1+9^n}$
   - $a_n = \ln(2n^2 + 1) - \ln(n^2 + 1)$
   - $a_n = \frac{e^n+e^{-n}}{e^{2n}-1}$
5. Find the limit of the following function
   - $\lim_{x\to\infty} \frac{3x-2}{2x+1}$
   - $\lim_{x\to\infty} \frac{1-x-x^2}{2x^2-7}$
   - $\lim_{x\to\infty} \frac{6}{3+e^{-2x}}$
6. Find the limit of the following function
   - $\lim_{x\to 5} \frac{x^2-5x+6}{x-5}$
   - $\lim_{x\to 2} \sqrt{\frac{2x^2+1}{3x-2}}$
   - $\lim_{h\to 0} \frac{(2+h)^3-8}{h}$