



MATHEMATICS 201-NYA-05

Differential Calculus

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Maple Exercises

1. Consider the function $f(x) = 2x - \frac{x}{3x+3}$.

- Define f as a function.
- Evaluate $f\left(\frac{-1}{2}\right)$.
- Factor $f(x)$.
- Simplify $f\left(\frac{1}{t-1}\right)$.
- Find the x -intercepts.
- Sketch the graph of $f(x)$.
- On the same graph, sketch $f(x)$ along with the line $y = \frac{2}{3}x - \frac{1}{3}$.

2. Find the following limits.

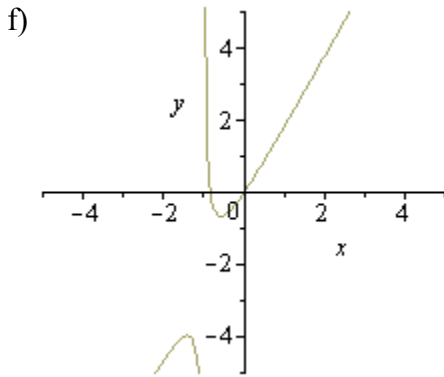
- $\lim_{x \rightarrow 3} \frac{x^2 - 9}{x^2 - 3x}$
- $\lim_{x \rightarrow 0} \frac{\cos x - 1}{e^x - 1}$
- $\lim_{x \rightarrow 2^-} \ln(2 - x)$
- $\lim_{x \rightarrow -\infty} x e^{-x^2}$

3. Sketch the graph of the following curves.

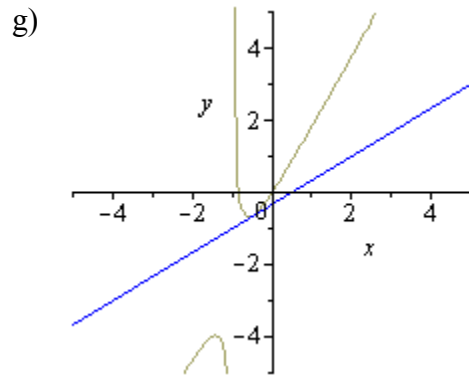
- $f(x) = \frac{x}{\sqrt{x^2 + 1}}$
- $f(x) = x \ln x$
- $(x^2 + y^2)^2 = 4x^2 y$

ANSWERS

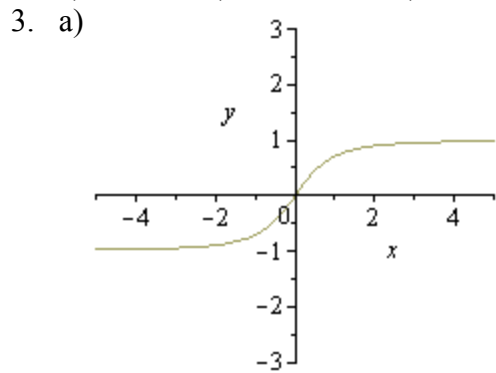
1. b) $\frac{-2}{3}$ c) $\frac{x(6x+5)}{3(x+1)}$ d) $\frac{5t+1}{3t(t-1)}$



e) $\frac{-5}{6}, 0$



2. a) 2 b) 0 c) $-\infty$



d) 0

