

Problem 1

(1+1+1+1+3+3 points)

Draw the graphs of the following equations in two variables x and y .

- a) $-3x + 2y = 2$
- b) $x = 1$
- c) $(x + 2)^2 = 2(2y + 1)$
- d) $(x + 2)^2 + (y - 3)^2 = 6$
- e) For each of the examples above, determine whether it is the graph of a function $y = f(x)$.
If so, find $f(x)$, its domain, and its range.
- f) For each of the examples above, determine whether it is the graph of a function $x = g(y)$.
If so, find $g(y)$, its domain, and its range.

Problem 2

(10 points)

Let $f(x) = 2^{x/2}$. Find the inverse function of f , denoted f^{-1} , and state domain and range of f and f^{-1} .

Note that f^{-1} is common symbolic notation for the inverse function. It does, however, **not** denote the function $1/f(x)$!

Problem 3

(2+2+2+2+2 points)

Compute following limits

- a) $\lim_{x \rightarrow 1} x^2 + 2x - 2$
- b) $\lim_{s \rightarrow 0} \frac{s^3}{s}$
- c) $\lim_{t \rightarrow 4} \frac{t^2 - 16}{t - 4}$
- d) $\lim_{v \rightarrow 2} \frac{2 - v}{\frac{1}{2} - \frac{1}{v}}$
- e) $\lim_{y \rightarrow 0} \frac{\sqrt{2-y} - \sqrt{2+y}}{-4y}$