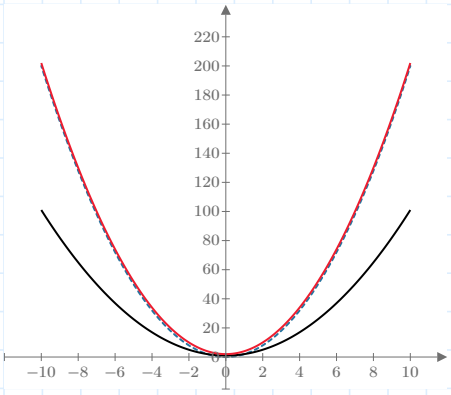


$2\ x^2$

x^2+1

$2\ x^2+2$

x

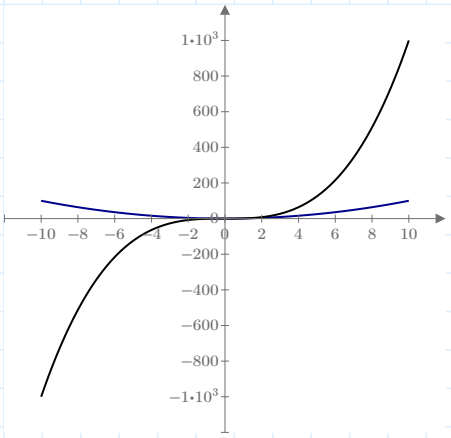
Problem 2-1

$$f(x) := 2\ x^2$$
$$g(x) := x^2+1$$

$$\frac{d}{dx} f(x) \to 4 \cdot x$$

$$\frac{d}{dx} g(x) \to 2 \cdot x$$

f(x) and g(x) grow at the same rate since there is a constant that can make the derivatives equal



x^2

x^3

x

problem 2-2

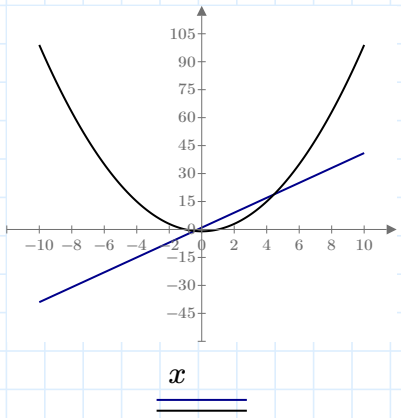
$$f(x) := x^2$$

$$g(x) := x^3$$

$$\frac{d}{dx} f(x) \to 2 \cdot x$$

$$\frac{d}{dx} g(x) \to 3 \cdot x^2$$

f(x) grows no faster than g(x)



$4\ x+1$

x^2-1

x

problem 2-3

$$f(x) := 4\ x+1$$

$$g(x) := x^2-1$$

$$\frac{d}{dx} f(x) \to 4$$

$$\frac{d}{dx} g(x) \to 2 \cdot x$$

f(x) grows no faster than g(x)