

Section 2.3

Polynomial function

$$f(x) = a_n x^n + a_{n-1} x^{n-1} + \dots + a_2 x^2 + a_1 x + a_0 \quad (a_n \neq 0)$$

specific case

$$y = f(x) = a_1 x + a_0$$

$$(y = mx + b)$$

↑ slope ↑ y-intercept

linear function

ex Bounce check

	2004	2007	2009
Year	0	3	5
Revenue	27.5	34	38

a) Plot

b) Projection for 2010

c) rate of increase?

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{38 - 34}{5 - 3} = \frac{4}{2} = 2$$

$$y = mx + b = 2x + b$$

$$(0, 27.5)$$

$$27.5 = 2(0) + b$$

$$27.5 = b$$

$$y = 2x + 27.5$$

another specific example

P2

$$y = f(x) = a_2 x^2 + a_1 x + a_0 \quad (= ax^2 + bx + c)$$

quadratic function

EX) $A(x) = .012313x^2 + .7545x + 313.9$

~~the~~ ~~quadratic~~ ~~function~~

$x=1$ corresponds to 1958

$$1 \leq x \leq 53$$

a) ~~predict~~ ~~estimate~~ CO_2 in 1980

b) Predict CO_2 in 2013

~~the~~

$$\begin{aligned} a) \quad A(23) &= .012313(23)^2 + .7545(23) + 313.9 \\ &= \end{aligned}$$

$$b) \quad A(56) = .012313(56)^2 + .7545(56) + 313.9$$

rational functions

Section 2.5

P3

$$f(x) = \frac{p(x)}{q(x)}$$

EX

$$f(x) = \frac{3x^3 + x^2 - x + 1}{x - 2}$$

$$g(x) = \frac{x^2 + 1}{x^2 - 1}$$

Domain: all real numbers except values for which $q(x) = 0$

Power functions

$$f(x) = x^n$$

EX $f(x) = \sqrt{x} = x^{1/2}$

$$g(x) = \frac{1}{x^2} = x^{-2}$$

combinations

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

$$h(x) = (1+2x)^{1/2} + \frac{1}{(x^2+2)^{3/2}}$$

supply / demand

