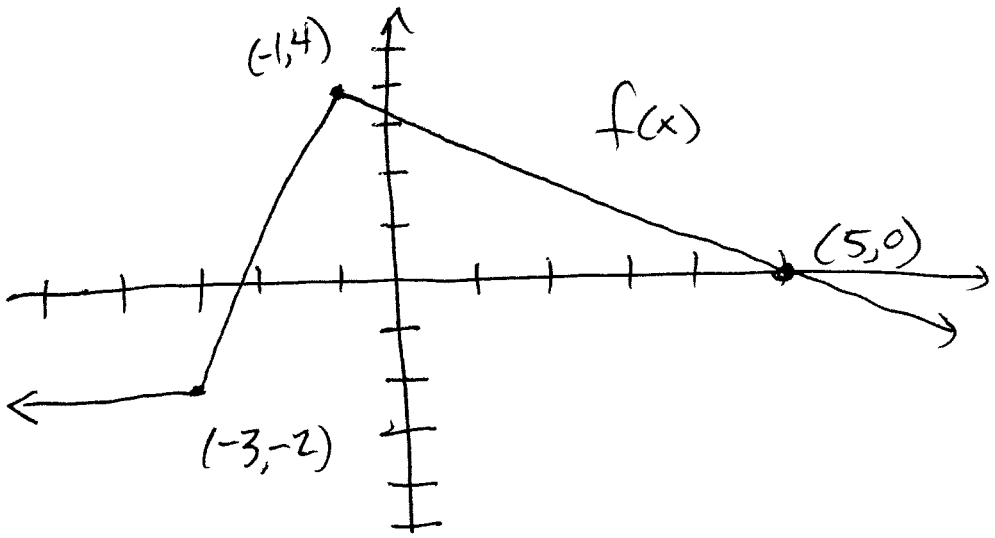
M121C Fall 2009 HW 3

What got graded: § 2.2 # 28

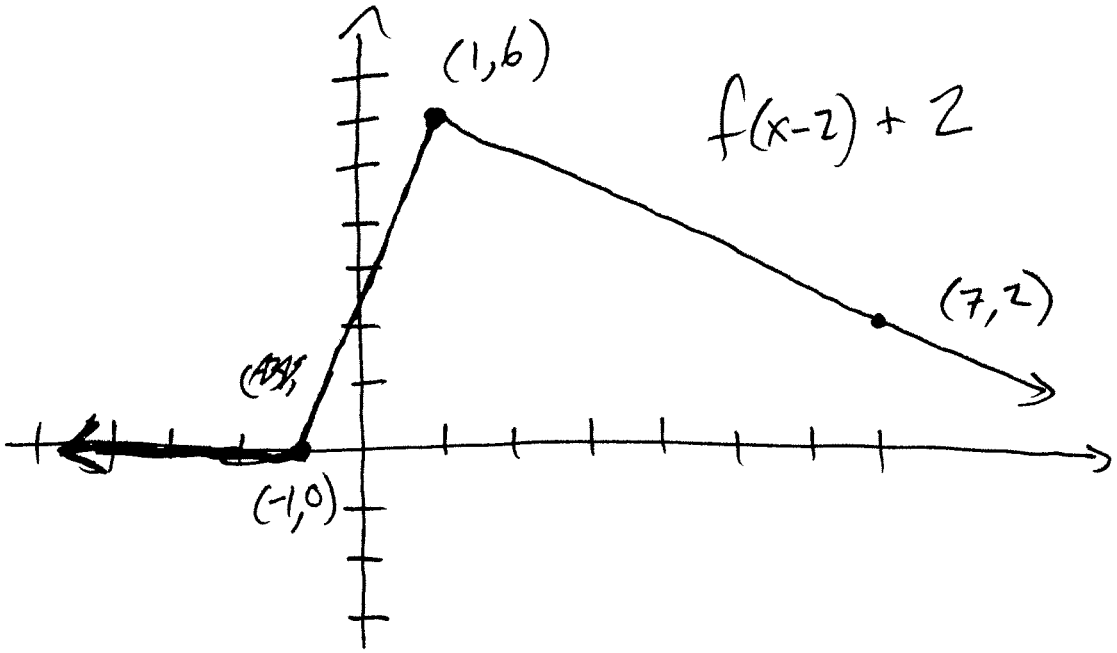
§ 2.3 # 22, 46

(#28) Here is the graph of $f(x)$:

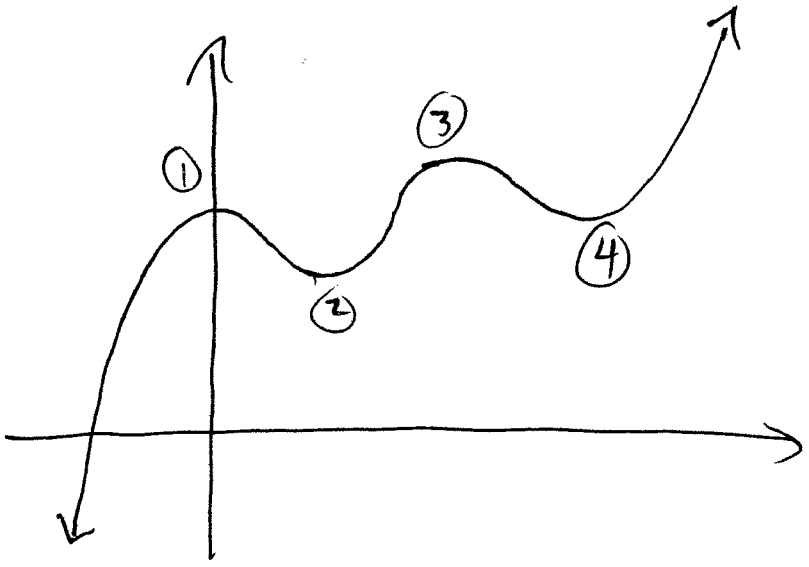


Use this to sketch the graph of $f(x-2)+2$.

Solution: We shift the graph of f to the right by 2 units, and then up by 2 units:



#22 The graph of the polynomial is



It has 4 turns so its degree is at least 5. Its degree is odd b/c the ends of the graph point to $+\infty$ and $-\infty$. The leading coefficient is positive

#46 Average cost $\bar{C}(x) = \frac{600}{x+20}$ $\frac{\text{dollars}}{x \text{ units of yogurt}}$.

(a) Find the quantities:

$\bar{C}(10) = \frac{600}{10+20} = \frac{600}{30} = \$20/\text{unit}$

$\bar{C}(20) = \frac{600}{20+20} = \frac{600}{40} = \$15/\text{unit}$

$\bar{C}(50) = \frac{600}{70} \approx \$8.57/\text{unit}$

$\bar{C}(75) = \frac{600}{95} \approx \$6.32/\text{unit}$

$\bar{C}(100) = \frac{600}{120} = \$5/\text{unit}$

(b) Q: Which is a more reasonable domain, $[0,\infty)$ or $(0,\infty)$ for $\bar{C}(x)$, and why?

A: $(0,\infty)$ b/c it doesn't make sense to ask how much it costs on average to make 0 things.

Find

(c) Asymptotes / Intercepts. (d) Graph $\bar{C}(x)$

Soln:

$\bar{C}(x) = \dfrac{600}{x+20}$ has a vertical asymptote

at $x = -20$ ← not in domain.

and horizontal asymptote at $\dfrac{0}{1} = 0$.

The y-intercept is $\bar{C}(0) = \dfrac{600}{20} = 30$.

Graph: