Answers to the Even Bold Problems
Lessons 19 – 27

Homework 19 page 86:
40) (a)   8.4%   (b)   8.2%
42) (a) $26,413.52   (b) $32,913.27   (c) $43,331.33
48) (a)   4000 bacteria   (b)   500 bacteria

Homework 20 page 232:
42)   The rate of growth after 8 years is about $1934 per year.
58) (a)   After 4 years, the sample is decreasing by about 44.9 grams per year.
       (b)   After 6 years, the sample is decreasing by about 24.1 grams per year.
       (c)   After 10 years, the sample is decreasing by about 7.0 grams per year.

Homework 21 page 98:
90) (a)   decibel rating is approximately 70.
       (b)   decibel rating is approximately 120.
92) (a)   Richter scale reading is a 6.0 earthquake.
       (b)   Richter scale reading is an 8.0 earthquake.

Homework 22 page 240:

56) (a) $R'(x) = \dfrac{60}{2x+1}$ (b) $P(x) = 30\ln(2x+1) - \dfrac{1}{2}x$

       (c)   When number of items produced and sold is 60 the marginal profit is $0/item,
       (d)   Sale of the next, 61st, item would yield no profit.
64) (a)   When the temperature is 15°, there are about 3 matings in an hour.
       (b)   When the temperature is 25°, there are about 6 matings in an hour.
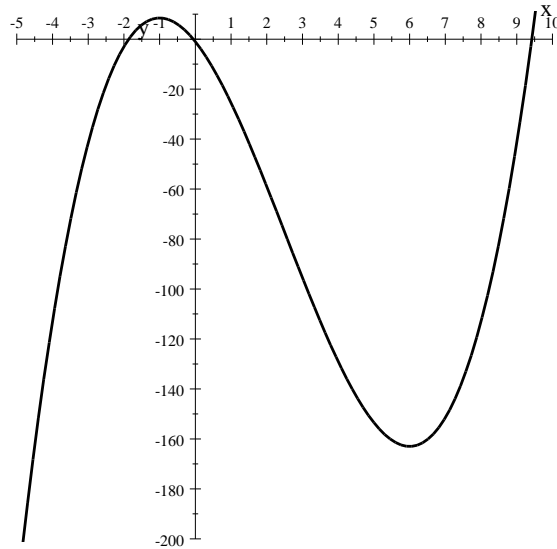
Homework 23 page 260:
52)   The number of people infected will begin to decline after day 9.

No even bold problems for homeworks 24, 25, or 26.

4)   Domain: $(-\infty, \infty)$,   no symmetry, y-intercept is $(0, -1)$,
        Increasing on $(-\infty, -1) \cup (6, \infty)$, Decreasing on $(-1, 6)$
        Relative maximum at point $P(-1, \frac{17}{2})$, Relative minimum at point $P(6, -163)$
        Concave upward on $\left(\frac{5}{3}, \infty\right)$, Concave downward on $\left(-\infty, \frac{5}{2}\right)$
        Point of inflection at $(\frac{5}{2}, -77.25)$
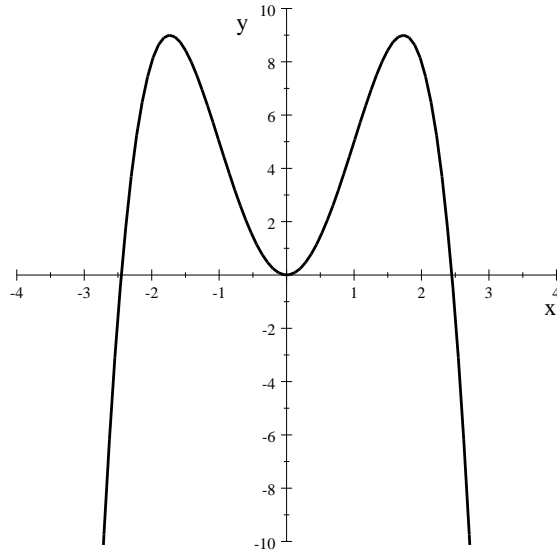   Graph:

6)   Domain: $(-\infty, \infty)$,   no symmetry, y-intercept is $(0, -11)$
        Increasing on $(-\infty, \infty)$, never decreasing   No relative maximum, no relative minimum
        Concave upward on $(2, \infty)$, Concave downward on $(-\infty, 2)$
        Point of inflection at $(2, -3)$
        Graph:
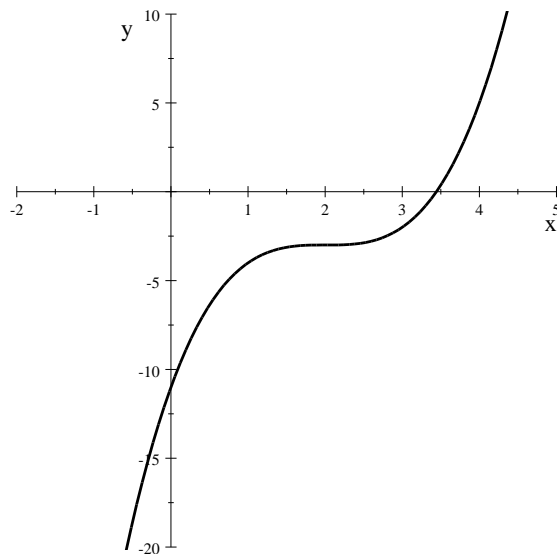
8)   Domain: $(-\infty, \infty)$,   symmetry about the y-axis, y-intercept: $(0, 0)$
x-intercepts: $(-\sqrt{6}, 0)$, $(0, 0)$, $(\sqrt{6}, 0)$
Increasing on $(-\infty, -\sqrt{3})$ and $(0, \sqrt{3})$, Decreasing on $(-\sqrt{3}, 0)$ and $(\sqrt{3}, 0)$
Relative minimum at point $(0,0)$
Relative maximums at points $-\sqrt{3}, 9)$ and $(\sqrt{3}, 9)$
Concave upward on $(-1, 1)$ Points of inflection at $(-1, 5)$ and $(1, 5)$
Graph

9)   Domain: $(-\infty, \infty)$,   no symmetry, y-intercept: $(0, 0)$, x-intercepts: $(0, 0)$ and $(4, 0)$
Increasing on $(3, \infty)$, Decreasing on $(-\infty, 3)$,   relative minimum at point $(3, -27)$
Concave upward on $(-\infty, 0) \cup (2, \infty)$,   Concave downward on $(0, 2)$
Points of inflection at $(0, 0)$ and $(2, -16)$
Graph