Section 1.1, problem 54: ***corrected!***

The domain of the function $G(x) = \dfrac{x+4}{x^3-4x}$ is $\{x : x \neq -2, 0, 2\}$
(because $x^3 - 4x = x(x^2-4) = 0$ if $x = -2$, $x = 0$ or $x = 2$)

Section 1.2, problem 42:

(a) The temperature of a bowl of soup as a function of time – graph *II*.

(b) The number of hours of daylight per day over a two-year period – graph *V*.

(c) The population of Texas as a function of time – graph *IV*.

(d) The distance traveled by a car going at a constant velocity as a function of time – graph *III*.

(e) The height of a golf ball hit with a 7-iron as a function of time – graph *I*.

Section 1.3, problem 34:

If $f(x) = 2x^4 - x^2$, then

$$f(-x) = 2(-x)^4 - (-x)^2 = 2(-1)^4x^4 - (-1)^2x^2 = 2x^4 - x^2 = f(x),$$

(because $(-1)^4 = (-1)^2 = 1$) so this function is *even*.

Section 1.3, problem 68:

We have $g(x) = x^2 + 1$, so...

(a) The average rate of change from $x = -1$ to $x = 2$ is

$$\frac{g(2) - g(-1)}{2 - (-1)} = \frac{5-2}{2+1} = 1.$$

(b) The secant line connecting the points $(-1, g(-1))$ and $(2, g(2))$ has slope $m = 1$ (the average rate of change from (a)), and passes through the point $(-1, g(-1))$. We find its equation using the *point-slope* formula:

$$y - g(-1) = m(x - (-1)) \implies y - 2 = 1(x+1) \implies \boxed{y = x + 3}.$$