1 *Let f be the function such that*

$$f(x) = 4x^3$$

for all possible x. Is f even, odd, or neither? (Either show what calculation you make to decide this, or draw a graph that shows your answer.)

First,

$$f(-x) = 4(-x)^3 = 4(-x^3) = -4x^3;$$

next,

$$-f(x) = -(4x^3) = -4x^3.$$

These are the same, so f is **odd**.

2 *Let g be the function given by*

$$g(x) = x^2 - 2.$$

What is the average rate of change of g from -2 to 1? (Show what numerical calculation you make.)

First,

$$g(-2) = (-2)^2 - 2 = 4 - 2 = 2;$$

next,

$$g(1) = (1)^2 - 2 = 1 - 2 = -1.$$

Therefore, the average rate of change is

$$\frac{g(1) - g(-2)}{(1) - (-2)} = \frac{-1 - 2}{1 + 2} = \frac{-3}{3} = -1.$$

3 *Let h be the function shown in Exercises 3.3.11–20 of the textbook.*

a *How many local maxima does h have?*

It has 2 local maxima. (See $(-2, 6)$ and $(2, 10)$ on the graph.)

b *For each local maximum of h, state* where *it is and* what *it is.*

One local maximum is at -2; it is 6. The other local maximum is at 2; it is 10.