Solutions to Exercise Set 1.7

6. \( h_1(-3) = (-3)^2 + (-3) - 5 = 1. \)

12. \( h_2(6) = (6 + 2)\sqrt{3 + 6} = 24. \)

18. \( (u \circ 2g)(x) = u(2g(x)) = u(2x^3) = \sqrt{2x^3} = \sqrt{2} \cdot x^{3/2}. \)

24. Since \( u(x) = x^2, f(u(x)) = f(x^2) = \sqrt{x^2 + 1}. \)

So, let \( f(x) = \sqrt{x + 1}. \)

30. e.

36. \( f(x) = \begin{cases} x^2 - 2, & x \leq 2 \\ 4 - x, & x > 2 \end{cases} \)

42. Since \( x = 2t, \) the total variable costs are
\( C(2t) = 30(2t) + 0.02(2t)^2 = 60t + 0.08t^2. \)

48. a. The profit \( P(x) \) from the production and sales of \( x \) computers per week is given by

\[ P(x) = R(x) - C(x) - 0.05x. \]

b. \( P(x) = 5000x - (25,000 + 2,500x + 5x^{2/3} + 2x^2) - 0.05x \\
= 2,499.95x - 25,000 - 5x^{2/3} - 2x^2. \)