Chapter 2 Practice Test

For questions 1 to 5, select the best answer.

1. Which statement is true for the function
   $f(x) = (x - 2)^2 - 3$?
   A The x-intercepts are 2 and –3.
   B The x-intercepts are –2 and –3.
   C The vertex is at $(2, -3)$.
   D The vertex is at $(-2, -3)$.

2. Which statement is true for the function
   $y = (x + 1)(x + 5)$?
   A The x-intercepts are 1 and 5.
   B The x-intercepts are –1 and –5.
   C The vertex is at $(-1, 5)$.
   D The axis of symmetry is $x = -1$.

3. Which statement is true for the function
   $f(x) = x^2 - 3x - 6$?
   A The vertex is at $(3, -6)$.
   B The y-intercept is –3 and the parabola
     opens upward.
   C The y-intercept is –6 and the parabola
     opens upward.
   D The y-intercept is –6 and the parabola
     opens downward.

4. Which polynomial and factors does this
   model represent?

   A $x^2 + 9x + 14 = (x + 9)(x + 14)$
   B $x^2 + 9x + 14 = (x + 4)(x + 5)$
   C $x^2 + 9x + 14 = (x + 7)(x + 2)$
   D none of the above

5. Which is the factored form of $4x^2 + 1$?
   A $(2x - 1)(2x + 1)$
   B $(2x + 1)^2$
   C $4x(x + 1)$
   D The expression is not factorable.

6. a) Draw an algebra tile area model for the
      expression $4x^2 + 7x + 3$.
   b) Identify the factors of the polynomial.

7. Write each function in standard form. Then,
   identify the y-intercept.
   a) $f(x) = 4(x - 1)(x - 5)$
   b) $g(x) = -2(x + 6)^2 - 3$

8. Fully factor each expression, if possible. If it
   is not possible, write *not factorable* and
   explain why.
   a) $25k^2 - 100$ b) $n^2 + 14n + 49$
   c) $t^2 - 4t - 45$ d) $2x^2 - 20x + 50$
   e) $z^2 - 2z + 2$ f) $2y^3 - 98y$

9. a) In which form is the function
      $f(x) = -(x - 3)(x + 7)$ expressed? Does
      this parabola open upward or downward?
   b) What are the x-intercepts?
   c) Find the coordinates of the vertex. Is it a
      maximum or a minimum? Explain.
   d) What is the axis of symmetry?
   e) What is the y-intercept?
   f) Graph the function.
   g) Identify the intervals for which the
      function is
      i) positive or negative
      ii) increasing or decreasing

10. The flight path of a firework is modelled by
    the function $h(t) = -5(t - 5)^2 + 127$, where h
    is the height, in metres, t seconds after being
    fired.
    a) Graph the function.
    b) What is the maximum height reached by
       the firework?
    c) How high above ground was the firework
       fired from?
    d) What is the hang time of the firework?