Practice 2.8: Solving Quadratics by Completing the Square B

For problems 1–4, find the value of c so that the expression is a perfect square trinomial.

1. $x^2 + 22x + c$

2. $x^2 + 100x + c$

Convert each quadratic function given in standard form to vertex form.

3. $f(x) = x^2 - 2x - 2$

4. $g(x) = 0.3x^2 + 1.2x + 1.2$

Solve problems 5–7 by completing the square.

5. $x^2 - 8x + 2 = 0$

6. $2x^2 + 2x = 5$

7. $x^2 + 4x = 21$

Use what you know about completing the square to solve problems 8–10. Determine whether your answers are reasonable and explain why or why not.

8. A dog pen has an area of 60 square feet. The width of the pen is 2 feet shorter than its length. Find the length of the pen.

9. A student kicks a ball during gym class. The ball's height in feet x seconds after being kicked is given by $-16x^2 + 40x$. After how many seconds will the ball hit the ground?

10. The fuel economy in miles per gallon of a certain truck is given by the expression $-0.02x^2 + 1.5x + 3.4$, where x is the truck's speed in miles per hour. For what speed(s) does the truck have a fuel economy of 20 miles per gallon?