Challenge Practice

For use with the lesson "Solve Polynomial Equations in Factored Form"

In Exercises 1–5, find a polynomial that has these given roots. Write the result as a polynomial with *x* as the variable, in both factored form and standard form.

1. 1, 2, 3

2. $-1, 0, 1$

3. 0, 0, 1, 1

4. $0, \frac{1}{2}, 2$

5. $-1, -\frac{2}{3}, -3$

6. A rectangular pool whose long side is twice as long as its narrow side is being built. There will be a paved border around all sides of the pool that is 5 feet wide around three sides and 10 feet wide around one of the narrow ends to accommodate a diving platform. The total area of the pool and the border is 1650 square feet. Write an equation for the area of the pool and border where *x* represents the length of the short side of the pool.

7. In Exercise 6, find the length of the sides of the pool.

8. Consider the equation $x^3 - xy^2 = 0$. What are the possible values of *x* and *y* that make the equation hold true?

9. Consider the equation $x^4 - x^2y^2 = 0$. What are the possible values of *x* and *y* that make the equation hold true?

10. Consider the equation $(x^2 + y^2)(x^2 - y^2) = 0$. What are the possible values of *x* and *y* that make the equation hold true?