LESSON 8.5 Challenge Practice
For use with the lesson "Factor $x^2 + bx + c$"

In Exercises 1–5, use the given factor formula and the substitution method to factor the expression.

$x^2 + (a + b)x + ab = (x + a)(x + b)$

Example: $y + y^{1/2} - 6$

Solution: Let $x = y^{1/2}$. Then $x^2 = y$ and the expression $y + y^{1/2} - 6$ becomes $x^2 + x - 6$. Now factor this expression using the given factor formula.

$x^2 + x - 6 = (x + 3)(x - 2)$

Finally, replace x with $y^{1/2}$.

$(x + 3)(x - 2) = (y^{1/2} + 3)(y^{1/2} - 2)$

1. $y^{2/3} + 6y^{1/3} + 8$

2. $y^4 - y^2 - 12$

3. $\dfrac{1}{y^2} - \dfrac{8}{y} - 9$

4. $\sqrt[5]{y^2} + 16\sqrt[5]{y} + 48$

5. $\sqrt{y} + 12\sqrt[4]{y} + 11$

In Exercises 6–10, use substitution to factor, then solve for *x*.

6. $x^4 - 3x^2 - 4 = 0$

7. $x^4 - 13x^2 + 36 = 0$

8. $\dfrac{1}{x^2} - \dfrac{1}{x} - 12 = 0$

9. $x - \sqrt{x} - 6 = 0$

10. $x^4 - 16x^2 + 48 = 0$