

Challenge: Skills and Applications

For use with pages 625–632

In Exercises 1–4, factor the expression completely.

1. $4(x - 6)^3 + 17(x - 6)^2 - 15(x - 6)$
2. $x^8 - 256$
3. $(4x^2 - 20x + 25) - 81$
4. $8x^3 - 72x + 9x^2 - 81$

In Exercises 5–8, use factoring to solve the equation.

5. $(r + 4) = -2(r + 4)^2$
6. $4p^4 = 9p^2$
7. $8x^3 + 2x^2 + 44x^2 + 11x = 0$
8. $(r^2 - 7)^2 + 4 = 4(r^2 - 7)$
9. a. The polynomial $x^3 - 19x + 30$ can be factored into $(x + a)(x^2 + 2x - 15)$ for some value of a . What is that value?
b. Find the x -intercepts of the graph of the equation $x^3 - 19x + 30$.

In Exercises 10–12, use the following information.

A track runs along the outer edge of a circular park. The track is the same width all the way around the park. The area inside the track is given by the trinomial $\pi r^2 - 4\pi r + 4\pi$, where r is the radius of the entire park in meters.

10. Factor $\pi r^2 - 4\pi r + 4\pi$ completely.
11. What is the width of the track?
12. If the area of the park that is inside the track is 100π , what is the radius of the entire park?