

5-6 Practice Part 1
The Remainder and Factor Theorems

Use synthetic substitution to find $f(-3)$ and $f(4)$ for each function.

1. $f(x) = x^2 + 2x + 3$

2. $f(x) = x^2 - 5x + 10$

3. $f(x) = x^3 - 2x^2 - 2x + 8$

4. $f(x) = x^3 - x^2 + 4x - 4$

Given a polynomial and one of its factors, find the remaining factors of the polynomial.

5. $x^3 + 3x^2 - 6x - 8; x - 2$

6. $x^3 + 7x^2 + 7x - 15; x - 1$

7. $3x^3 - 4x^2 - 17x + 6; x + 2$

8. $4x^3 - 12x^2 - x + 3; x - 3$

9. POPULATION The projected population in thousands for a city over the next several years can be estimated by the function $P(x) = x^3 + 2x^2 - 8x + 520$, where x is the number of years since 2005. Use synthetic substitution to estimate the population for 2015.

10. VOLUME The volume of water in a rectangular swimming pool can be modeled by the polynomial $2x^3 - 9x^2 + 7x + 6$. If the depth of the pool is given by the polynomial $2x + 1$, what polynomials express the length and width of the pool?