If you can solve nearly all of the following problems with little difficulty, then the Art of Problem Solving textbook **Introduction to Algebra** would only serve as a review for you.

1. A box containing 3 oranges, 2 apples, and one banana weighs 15 units. Another box containing 5 oranges, 7 apples, and 2 bananas weighs 44 units. A third box containing 1 orange, 3 apples, and 5 bananas weighs 26 units. How much does each fruit weigh?

2. The expression $x^5 + y^5$ can be written as the product of $x + y$ and another factor. Find that other factor.

3. If $x = \dfrac{1 - i\sqrt{3}}{2}$, then what is $\dfrac{1}{x^2 - x}$?

4. Find all values of z such that $z^4 - 4z^2 + 3 = 0$.

5. Find the radius and the center of the circle that is the graph of the equation $4x^2 + 4y^2 + 4x - 16y = 7$.

6. If $f(x) = ax^4 - bx^2 + x + 5$ and $f(-3) = 2$, then what is $f(3)$?

7. For how many positive integers b is $\log_b 729$ a positive integer?

8. For what real values of x is $(1 - |x|)(1 + x)$ positive?

9. A rubber ball is dropped from a 100 ft tall building. Each time it bounces, it rises to three-quarters its previous height. So, after its first bounce it rises to 75 ft, and after its second bounce it rises to 3/4 of 75 ft, and so on forever. What is the total distance the ball travels?

10. Find all solutions to the equation $\sqrt[3]{x^3 - x^2 - 10} = x - 1$.

The answers to Do You Know Introduction to Algebra are below.

1. Oranges weigh 1 unit, apples weigh 5 units, and bananas weigh 2 units.

2. $x^4 - x^3y + x^2y^2 - xy^3 + y^4$

3. -1

4. $\sqrt{3}, 1, -1,$ and $-\sqrt{3}$

5. The radius is $\sqrt{6}$ and the center is $\left(-\frac{1}{2}, 2\right)$.

6. 8

7. There are 4 such integers: 3, 9, 27, 729.

8. It is positive when $x < -1$ or $-1 < x < 1$.

9. 700 ft

10. $3, -3/2$