

Additional Practice**Lesson 4.10**

1. Use the Binomial Theorem to expand each of the following.

a. $(2x + y)^6$

b. $(x^2 + 3y)^5$

2. Determine the coefficient of each of the following terms in the expansion of $(x + y)^{40}$.

a. x^2y^{38}

b. $x^{24}y^{16}$

c. $x^{34}y^6$

d. $x^{30}y^{10}$

3. a. Write a polynomial that you can factor in the form $(a + b)^n$ where:

- The constant term is not 1.
- There is exactly one variable, x .
- There are at least 6 terms.

b. Write a polynomial that you can factor in the form $(a + b)^n$ where:

- The constant term is 1.
- There is exactly one variable, x .
- There are at least 5 terms.

4. Write an equivalent expression for each of the following.

a. $(x - 2)^n$

b. $(y - z)^n$

5. How could you simplify the following sum? Let $n = 6$.

$$\sum_{k=0}^n \binom{n}{k} (-1)^k$$

What if n is 7 instead of 6? What if n is 12?