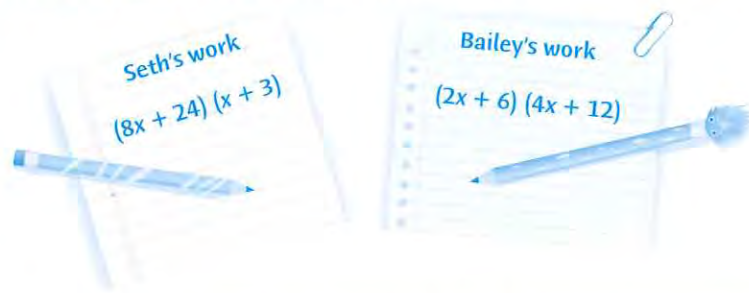


**CRITIQUE & EXPLAIN**

Seth and Bailey are given the polynomial $8x^2 + 48x + 72$ to factor.



- A. Analyze each factored expression to see if both are equivalent to the given polynomial.
- B. How can the product of different pairs of expressions be equivalent?
- C. **Look for Relationships** Find two other pairs of binomials that are different, but whose products are equal. © MP.7

HABITS OF MIND

Communicate Precisely What mathematical language was important to use in explaining the relationship between Seth's and Bailey's work? © MP.6

**EXAMPLE 1** **Try It!** Understand Factoring a Perfect Square

1. Factor each trinomial.

a. $4x^2 + 12x + 9$

b. $x^2 - 8x + 16$

EXAMPLE 2 **Try It!** Factor to Find a Dimension

2. What is the radius of a cylinder that has a height of 3 in. and a volume of $\pi(27x^2 + 18x + 3)$ in.³?

HABITS OF MIND

Use Structure How can you identify whether a given trinomial is a perfect square trinomial? © MP.7



**EXAMPLE 3**  **Try It!** Factor a Difference of Two Squares

3. Factor each expression.

a. $x^2 - 64$

b. $9x^2 - 100$

EXAMPLE 4  **Try It!** Factor Out a Common Factor

4. Factor each expression completely.

a. $4x^3 + 24x^2 + 36x$

b. $50x^2 - 32y^2$

HABITS OF MIND

Generalize Can you extend the difference of squares factoring pattern to $x^4 - y^4$? Explain. © MP.8

Do You UNDERSTAND?

- ESSENTIAL QUESTION** What special patterns are helpful when factoring a perfect-square trinomial and the difference of two squares?
- Error Analysis** A student says that to factor $x^2 - 4x + 2$, you should use the pattern of a difference of two squares. Explain the error in the student's thinking. © MP.3
- Vocabulary** How is a perfect square trinomial similar to a perfect square number? Is it possible to have a perfect square binomial? Explain.
- Communicate Precisely** How is the pattern for factoring a perfect-square trinomial like the pattern for factoring the difference of two squares? How is it different? © MP.6
- Construct Arguments** Why is it important to look for a common factor before factoring a trinomial? © MP.3

Do You KNOW HOW?

Identify the pattern you can use to factor each expression.

6. $4x^2 - 9$

7. $x^2 + 6x + 9$

8. $9x^2 - 12x + 4$

9. $5x^2 - 30x + 45$

10. $100 - 16y^2$

11. $3x^2 + 30x + 75$

Write the factored form of each expression.

12. $49x^2 - 25$

13. $36x^2 + 48x + 16$

14. $3x^3 - 12x^2 + 12x$

15. $72x^2 - 32$

16. What is the side length of the square shown below?



Area = $x^2 + 22x + 121$