

## Study Guide

**Factoring Differences of Squares**

Use the difference of squares to factor polynomials.

Difference of Squares	$a^2 - b^2 = (a - b)(a + b) = (a + b)(a - b)$
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**Example 1:** Factor  $4y^2 - 81z^2$ .

$$\begin{aligned} 4y^2 - 81z^2 &= (2y)^2 - (9z)^2 \\ &= (2y - 9z)(2y + 9z) \end{aligned}$$

$$2y \cdot 2y = 4y^2 \text{ and } 9z \cdot 9z = 81z^2$$

Use the difference of squares.

In some binomials you have to factor a GCF before you can factor the difference of squares.

**Example 2:** Factor  $50a^2 - 72$ .

$$\begin{aligned} 50a^2 - 72 &= 2(25a^2 - 36) \\ &= 2(5a - 6)(5a + 6) \end{aligned}$$

The GCF is 2.

Use the difference of squares.

**State whether each binomial can be factored as a difference of squares.**

1.  $a^2 - b^2$

2.  $x^2 + y^2$

3.  $a^2 - 36$

4.  $2p - \frac{1}{9}$

5.  $\frac{1}{2}m^2 + \frac{1}{4}n^2$

6.  $\frac{49}{289}x^2 - 1$

7.  $0.16m^2 + 0.25n^2$

8.  $225b^2 - a^2$

9.  $a - 16$

10.  $15x^2 + 5$

11.  $9y^2 - 4x^2$

12.  $-p^2 + 9q^2$

**Factor each polynomial, if possible. If the polynomial cannot be factored, write prime.**

13.  $m^2 - 16n^2$

14.  $4a^2 - 9b^2$

15.  $x^2 - 64$

16.  $-81 + a^4$

17.  $m^6 - 16n^4$

18.  $-2 + 2y^2$

19.  $p^2q^2 - \frac{1}{16}$

20.  $\frac{1}{4}z^4 - 25$

21.  $\frac{2}{3}x^2 - 9$

22.  $12x^2 - 27y^2$

23.  $6 - 54z^2$

24.  $(x + y)^2 - w^2$

25.  $3x^4 - 75$

26.  $(n + 7)^2 - 1$

27.  $2p^4 - 32q^4$