

## Difference of squares



LEVEL 1: The Basics

Factor each expression:

$$\diamondsuit \quad x^2 - 81$$

$$\diamondsuit \quad 36 - r^2$$

$$\diamondsuit \quad a^2 - 36$$

$$\diamondsuit \quad z^2 - 64$$

$$\diamondsuit \quad y^2 - 1$$

$$\diamondsuit \quad w^2 - 16$$

$$\diamondsuit \quad 64 - m^2$$

$$\diamondsuit \quad 1 - b^2$$

$$\diamondsuit \quad x^2 - 4$$

$$\diamondsuit \quad 121 - x^2$$

$$\diamondsuit \quad 100 - n^2$$

$$\diamondsuit \quad 16x^2 - 25$$

$$\diamondsuit \quad p^2 - 25$$

$$\diamondsuit \quad 4x^2 - 9$$

$$\diamondsuit \quad 9x^2 - 1$$

$$\diamondsuit \quad 25y^2 - 4$$

$$\diamondsuit \quad x^2 - 36y^2$$

$$\diamondsuit \quad 9a^2 - 16$$

$$\diamondsuit \quad 49 - x^2$$

$$\diamondsuit \quad b^2 - 0$$

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### LEVEL 2: Dive Deeper

Factor each expression completely:

$$\diamondsuit \quad 4x^2 - 49$$

$$\diamondsuit \quad (x + 3)^2 - 49$$

$$\diamondsuit \quad 25a^2 - 1$$

$$\diamondsuit \quad 1 - (2x - 1)^2$$

$$\diamondsuit \quad 81y^2 - 16$$

$$\diamondsuit \quad 81a^4 - 49b^2$$

$$\diamondsuit \quad x^4 - 1$$

$$\diamondsuit \quad 100 - x^4$$

$$\diamondsuit \quad 9m^2 - n^2$$

$$\diamondsuit \quad x^8 - 1$$

$$\diamondsuit \quad 100x^2 - y^2$$

$$\diamondsuit \quad 25x^2y^2 - 49z^2$$

$$\diamondsuit \quad 64 - 16y^2$$

$$\diamondsuit \quad 9 - x^2y^2$$

$$\diamondsuit \quad 36x^2 - 100$$

$$\diamondsuit \quad 64a^2 - 1$$

$$\diamondsuit \quad x^2 - 144$$

$$\diamondsuit \quad 4x^2 - 36$$

$$\diamondsuit \quad 121 - 16y^2$$

$$\diamondsuit \quad x^6 - 36$$

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### LEVEL 3: Mastering the Concept

$$\diamond (x^2 + 2x + 1) - 49$$

$$\diamond 36x^4 - 100y^2$$

$$\diamond 100a^4 - 1$$

$$\diamond (x + 5)^2 - 36$$

$$\diamond 9x^4 - 4y^4$$

$$\diamond (x - 1)^2 - 49$$

$$\diamond x^2y^2 - 81z^2$$

$$\diamond 64a^6 - 1$$

$$\diamond x^4 - 256$$

$$\diamond x^6 - 9y^6$$

$$\diamond 49x^2 - 121$$

$$\diamond (x^2 + 3)^2 - 16$$

$$\diamond 144a^2 - 81b^2$$

$$\diamond 25x^2 - (3y)^2$$

$$\diamond (2x + 3)^2 - 16$$

$$\diamond 9(x - 2)^2 - 81$$

$$\diamond x^8 - 625$$

$$\diamond x^2 - (y + 2)^2$$

$$\diamond 9x^6 - 16$$

$$\diamond (2x + 1)^2 - (3x - 2)^2$$

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### Challenge Problems

1. Factor completely:  $x^4 - 81$
2. Factor:  $x^8 - 1$
3. Factor completely:  $16x^4 - 81y^4$
4. Factor:  $25(x + 2)^2 - 36$
5. Prove that:  $(a + b)^2 - (a - b)^2 = 4ab$ . using difference of squares
6. If  $x^2 - y^2 = 24$  and  $x + y = 6$ , find the values of  $x$  and  $y$ .