

Factoring $a^2 - b^2$, $a^3 + b^3$, and $a^3 - b^3$

EXAMPLESFind the factors of $4x^2 - 4y^2$.Solution: Use the model $a^2 - b^2 = (a + b)(a - b)$.Let $a = 2x$, $b = 2y$; then $2x^2 - 2y^2 = (2x + 2y)(2x - 2y)$.Find the factors of $y^3 + z^3$.Solution: Use the model $a^3 + b^3 = (a + b)(a^2 - ab + b^2)$.Let $a = y$, $b = z$; then $y^3 + z^3 = (y + z)(y^2 - yz + z^2)$.Factor $x^3 - 8$.Solution: Use the model $a^3 - b^3 = (a - b)(a^2 + ab + b^2)$.Let $a = x$, $b = 2$; then $x^3 - 8 = (x - 2)(x^2 + 2x + 4)$.**Directions** Find the factors. Use a model.

1. $m^2 - n^2$ _____
2. $9x^2 - y^2$ _____
3. $16x^2 - 4y^2$ _____
4. $100x^2 - 25y^2$ _____
5. $49m^2 - 64n^2$ _____
6. $8x^3 + y^3$ _____
7. $p^3 + r^3$ _____
8. $x^3 + 27y^3$ _____
9. $8x^3 + 64y^3$ _____
10. $125s^3 + 8t^3$ _____
11. $t^3 - w^3$ _____
12. $8x^3 - 8y^3$ _____
13. $64a^3 - 8$ _____
14. $27 - b^3$ _____
15. $216a^3 - 125b^3$ _____