10-4

NAME _____ DATE _____

Factoring Differences of Squares

(Pages 581–586)

You can use the **difference of squares** rule to factor binomials that can be written in the form $a^2 - b^2$. Sometimes the terms of a binomial have common factors. If so, the GCF should always be factored out first.

Difference of Squares	$a^2 - b^2 = (a + b)(a - b)$ or $(a - b)(a + b)$

EXAMPLES

A Factor $b^2 - 49$.

$b^2 - 49$
$= (b)^2 - (7)^2$ $b \cdot b = b^2$ and $7 \cdot 7 = 49$
$= (b - 7)(b + 7)$ Use the difference of squares.

B Factor $7g^3h^2 - 28g^5$.

$7g^3h^2 - 28g^5$ Check for a GCF.
$= 7g^3(h^2 - 4g^2)$ GCF of $7g^3h^2$ and $28g^5$ is $7g^3$.
$= 7g^3(h - 2g)(h + 2g)$ $h^2 = h \cdot h$ and $4g^2 = 2g \cdot 2g$.

Try These Together

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

1. $x^2 - 4$ **2.** $y^2 + 16$ **3.** $a^2 - 144$

HINT: Both terms of the binomial must be squares. Also, the sum of two squares cannot be factored using the difference of two squares rule.

PRACTICE

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

4. $9b^2 - 25$ **5.** $4c^2 - 7$ **6.** $4z^2 - 16$

7. $9z^2 - 19$ **8.** $-25 + 81x^2$ **9.** $v^2q^2 - 0.49r^2$

10. $a^2b^2 - 0.36c^2$ **11.** $a^2b^2c^2 - x^2y^2z^2$ **12.** $x^2y^2 - 3$

13. $t^7 - t^3u^4$ **14.** $x^5 - x^3y^2$ **15.** $64k^2 - 24$

16. Factor $\frac{4}{25}x^2 - \frac{9}{16}y^2$. (*Hint:* Find fractions that when squared equal $\frac{4}{25}$ and $\frac{9}{16}$.)

17. **Standardized Test Practice** Factor $x^2 - (y + z)^2$.

A $(x + y + z)(x - y + z)$ **B** $(x + y + z)(x + y - z)$

C $(x + y + z)(x - y - z)$ **D** $(x + y - z)(x - y + z)$

Answers: **1.** $(x + 2)(x - 2)$ **2.** prime **3.** $(a - 12)(a + 12)$ **4.** $(3b + 5)(3b - 5)$ **5.** prime **6.** $4(z + 2)(z - 2)$ **7.** prime **8.** $(9x + 5)(9x - 5)$ **9.** $(vq + 0.7r)(vq - 0.7r)$ **10.** $(ab - 0.6c)(ab + 0.6c)$ **11.** $(abc - xyz)(abc + xyz)$ **12.** prime **13.** $t^3(t + u)(t - u)(t^2 + u^2)$ **14.** $x^3(x - y)(x + y)$ **15.** prime **16.** $\left(\frac{2}{5}x - \frac{3}{4}y\right)\left(\frac{2}{5}x + \frac{3}{4}y\right)$ **17.** C