Name _____ Period _____ Date _____

Factoring Differences of Squares

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 $b^2 - 49$.

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

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

$7g^3h^2 - 28g^5$ $\quad$ Check for a GCF.
$= 7g^3(h^2 - 4g^2)$ $\quad$ GCF of $7g^3h^2$ and $28g^5$ is $7g^3$.
$= 7g^3(h - 2g)(h + 2g)$ $\quad h^2 = h \cdot h$ 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.** $8(8k^2 - 3)$ **16.** $\left(\frac{2}{5}x - \frac{3}{4}y\right)\left(\frac{2}{5}x + \frac{3}{4}y\right)$ **17.** C

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Assignment _____

SHOW YOUR WORK IN THE SPACES PROVIDED *(one problem per space and number the problems)*

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