3.2 part 2 Algebra 2

Factoring Special Cases

Factoring Difference of Squares

ALGEBRA	EXAMPLES:
$a^2 - b^2 =$ $(a+b)(a-b)$	**EXAMPLE 13:** Factor $\sqrt{9x^2} - \sqrt{16}$ $(3x-4)(3x+4)$ **EXAMPLE 14:** Factor $\sqrt{25n^2} - \sqrt{81}$ $(5n+9)(5n-9)$ **EXAMPLE 15:** Factor $8 - 18g^2$ $2(4 - 9g^2)$ $2(2+3g)(2-3g)$

Factoring Perfect Square Trinomials

a perfect square trinomial: $a^2 + 2ab + b^2$

ALGEBRA	EXAMPLES
$\sqrt{a^2} + 2ab + \sqrt{b^2} = (a+b)^2$	**EXAMPLE 16:** Factor $x^2 + 6x + 9$ $(x+3)(x+3)$ $(x+3)^2$ **EXAMPLE 17:** Factor $4g^2 + 4gh + h^2$ $(2g+h)^2 = (2g+h)(2g+h)$
$\sqrt{a^2} - 2ab + \sqrt{b^2} = (a-b)^2$	**EXAMPLE 18:** Factor $x^2 - 10x + 25$ $(x-5)^2 = (x-5)(x-5)$ **EXAMPLE 19:** Factor $n^2 - 12n + 36$ $(n-6)^2 = (n-6)(n-6)$

Try this: Factor

1. $y^2 - 4$

$(y+2)(y-2)$

2. $49x^4 - 25y^{10}$

$7^2 \quad 5^2$

$(7x^2+5y^5)(7x^2-5y^5)$

3. $16x^4 - 40x^2y^3 + 25y^6$

$(4x^2-5y^3)(4x^2-5y^3) = (4x^2-5y^3)^2$

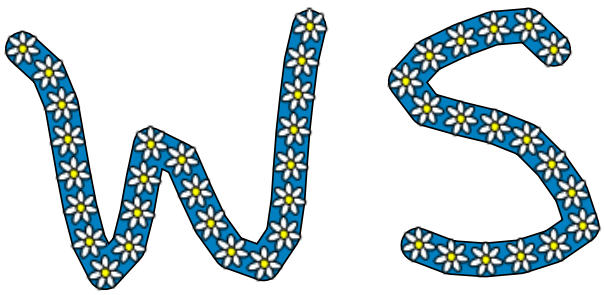
Factoring Sums & Differences of Cubes

$$a^3 + b^3 = (a + b)(a^2 - ab + b^2)$$

$$a^3 - b^3 = (a - b)(a^2 + ab + b^2)$$

ALGEBRA	EXAMPLES
$\sqrt[3]{a^3} + \sqrt[3]{b^3} =$ "a" "b" $(a+b)(a^2 - ab + b^2)$	**EXAMPLE 16:** Factor $x^3 - 27y^3$ $a = \sqrt[3]{x^3} = x$ $b = \sqrt[3]{27y^3} = 3y$ $x^3 - 3^3y^3$ $(x - 3y)(x^2 + 3xy + 9y^2)$ **EXAMPLE 17:** Factor $8x^3 - 64y^3$ $a = \sqrt[3]{8x^3} = 2x$ $b = \sqrt[3]{64y^3} = 4y$ $(2x - 4y)(4x^2 + 8xy + 16y^2)$
$\sqrt[3]{a^3} - \sqrt[3]{b^3} =$ "a" "b" $(a-b)(a^2 + ab + b^2)$	**EXAMPLE 18:** Factor $x^3 + 125$ $a = \sqrt[3]{x^3} = x$ $b = \sqrt[3]{125} = 5$ $(x + 5)(x^2 - 5x + 25)$ **EXAMPLE 19:** Factor $1000x^3 + 1$ $a = \sqrt[3]{1000x^3} = 10x$ $b = \sqrt[3]{1} = 1$ $(10x + 1)(100x^2 - 10x + 1)$ $(10x)^2$ 1^2

Homework:



Algebra 2

3.2 (part 2) Factoring Special Cases

Name: _____ Date: _____ Hr: __

Factor. Remember to check for a GCF first.

1. $z^2 - 64$

2. $25m^2 - 36$

3. $x^2 - 49y^2$

4. $8 - 18n^2$

5. $n^2 - 12n + 36$

6. $9x^3 - 12x^2 + 4x$

7. $4s^2 + 4sp + p^2$

8. $-3y^2 + 36y - 108$

9. $x^3 - 6 + 2x - 3x^2$

10. $y^2 + 2x + yx + 2y$

11. $r^2 + 4r + rs + 4s$

12. $x^3 + 2x^2 + 8x + 16$

13. $x^3 + 64$

14. $8y^3 + 125$

15. $54z^3 - 16w^3$

16. $512p^3 - 2160q^3$

Algebra 2

+X/16 3.2 (part 2) Factoring Special Cases

Name: Key Date: _____ Hr: __

Factor. Remember to check for a GCF first.

1. z^2-64

$(z-8)(z+8)$

2. $25m^2-36$

$(5m-6)(5m+6)$

3. x^2-49y^2

$(x-7y)(x+7y)$

4. $8-18n^2$

$2(4-9n^2)$

$2(2-3n)(2+3n)$

5. $n^2-12n+36$

$(n-6)^2$

6. $9x^3-12x^2+4x$

$x(9x^2-12x+4)$

$x(3x-2)^2$

7. $4s^2+4sp+p^2$

$(2s+p)^2$

8. $-3y^2+36y-108$

$-3(y^2-12y+36)$

$-3(y-6)^2$

9. $x^3 - 6 + 2x - 3x^2$

$x(x^2+2) - 3(x^2+2)$

$(x-3)(x^2+2)$

10. $y^2 + 2x + yx + 2y$

$y(y+x) + 2(y+x)$

$(y+2)(y+x)$

11. $r^2 + 4r + rs + 4s$

$r(r+4) + s(r+4)$

$(r+s)(r+4)$

12. $x^3 + 2x^2 + 8x + 16$

$x^2(x+2) + 8(x+2)$

$(x^2+8)(x+2)$

13. $x^3 + 64$

$(x+4)(x^2 - 4x + 16)$

14. $8y^3 + 125$

$(2y+5)(4y^2 - 10y + 25)$

15. $54z^3 - 16w^3$

$2(27z^3 - 8w^3)$

$2(3z - 2w)(9z^2 + 6zw + 4w^2)$

16. $512p^3 - 216q^3$

$8(64p^3 - 27q^3)$

$8(4p - 3q)(16p^2 + 12pq + 9q^2)$