Algebra II- Mrs. Tilus
Factoring Review

Name: Key

Factoring Thought Process

GCF: $6xy$

1. Greatest Common Factor → Example: $\frac{30x^2y}{6xy} + \frac{24xy}{6xy} - \frac{12xy^2}{6xy}$

   ◦ Do the terms have anything in common?

   $= 6xy(5x + 4 - 2y)$

2. Differences of Squares → Example: $49m^2 - 121n^2$ $a = \sqrt{49m^2}$ $b = \sqrt{121n}$

   ① 2 terms

   ② Subtraction

   ③ All variables and #'s are perfect Squares

   $a = 7m$ $b = 11n$

   $= (7m - 11n)(7m + 11n)$

3. Sum/Difference of Cubes → Example: $8x^3 + 125$ $a = \sqrt[3]{8x^3}$ $b = \sqrt[3]{125}$

   ① 2 terms

   ② All variables and #'s are perfect cubes

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

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

   $a = 2x$ $b = 5$

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

   $= (2x+5)(4x^2 - 10x + 25)$

4. $ax^2 + bx + c$, $a = 1$ → Example: $x^2 - 47x + 90$ → $(-2)(-45)$

   ◦ What multiplies to c and adds to b.

   $(x-2)(x-45)$

5. $ax^2 + bx + c$, $a \neq 1$ → Example: $3x^2 + 16x + 16$ $48 \rightarrow (4)(12)$

   ◦ Use splitting the middle process

   ★ Refer to page 15 in notepacket ★

   $3x^2 + 4x + 12x + 16$

   $x(3x+4) + 4(3x+4)$

   $(3x+4)(x+4)$

1. $x^2 + 17x - 18$

   $(x-1)(x+18)$

2. $2n^2 + 8$

   $2(n^2+4)$

3. $x^2 - 24x - 81$

   $(x-27)(x+3)$

4. $m^2 - 36$

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

5. $x^2 + 20x + 75$

$(x+5)(x+15)$

6. $x^3 + 64$

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

7. $25x^2 + 49$

Prime

8. $9 - t^2$

$(3-t)(3+t)$

9. $y^2 - 2y - 24$

$(y-6)(y+4)$

10. $x^2 - 26x + 48$

$(x-2)(x-24)$

11. $6x^2 + 23x + 20$

$(3x+4)(2x+5)$

12. $x^2 - 8x + 20$

Prime

13. $27x^3 - 125$

$(3x-5)(9x^2+15x+25)$

14. $9x^2 - 5x - 10$

Prime

15. $4x^3 + 44x^2 + 40x$

$4x(x+1)(x+10)$

16. $30n^2b - 87nb + 30b$

$3b(5n-2)(2n-5)$

17. $15y^3 - 9y^2 + 3y$

$3y(5y^2-3y+1)$

18. $2x^4 - 8x^2$

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