

ALGEBRA III

11/6/17

Factoring Day #3

Special Patterns

1) $7v^3 - 28v^2 - 7v$

$$7v (v^2 - 4v - 1)$$

$$7v (v - 1)(v + 1)$$

$$2) n^2 - 4n - 21$$

$$(n + 3)(n - 7)$$

$\xrightarrow{+3n}$
 $\xrightarrow{2n-7n}$

$$\begin{array}{cc} 1 & 21 \\ 3 & 7 \end{array}$$

$$3) 2x^2 - 14x + 12$$

$$2(x^2 - 7x + 6)$$

$$2 \cdot (x - 1)(x - 6)$$

$$\begin{array}{cc} 1 & 6 \\ 2 & 3 \end{array}$$

4) $7m^2 + 31m - 20$

$(m + 5)(7m - 4)$

Factor 4m

1	20
2	10
4	5

5) $4k^2 + 4k - 3$

$(k + \frac{1}{3})(4k - 3)$

~~3k~~ | k

$(2k - 1)(2k + 3)$

2k

1 3

$$6) 8x^2 - 37xy + 20y^2$$

$$(x - 4y)(8x - 5y)$$

$\overset{-32xy}{\text{---}}$
 $\underset{-5xy}{\text{---}}$

$$(2x \quad y)(4x \quad y)$$

1	20
2	10
4	5

Special Patterns

Difference of Squares

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

Sum and Difference of Cubes

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

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

Ex: Factor

$$x^2 - 9$$

$$x^2 - 3^2$$

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

$$4y^2 - 25$$

$$(2y)^2 - 5^2$$

$$(2y+5)(2y-5)$$

$$a^4 - 16b^4$$

$$(a^2)^2 - (4b^2)^2$$

$$(a^2 + 4b^2)(a^2 - 4b^2)$$

$$(a^2 + 4b^2)(a^2 - (2b)^2)$$

$$(a^2 + 4b^2)(a+2b)(a-2b)$$

$$16x^4 - 81$$

Ex: Factor

$$s^3 - 8$$

$$s^3 - 2^3$$

$$(s-2)(s^2+2s+4)$$

$$t^3 + 27$$

$$t^3 + 3^3$$

$$(t+3)(t^2-3t+9)$$

$$3a^3 + 81$$

$$3(a^3 + 27)$$

$$3(a+3)(a^2-3a+9)$$

$$2x^3 + 16y^3$$

Factor!

$$8(p^3 + 125)$$

$$8p^3 + 1000$$

$$(2p)^3 + (10)^3$$

$$(2p + 10) \left((2p)^2 - (2p)(10) + 10^2 \right)$$

$$(2p + 10) (4p^2 - 20p + 100)$$

$$x^2 + 16$$

$$16z^4 - 625y^4$$

$8 \overline{) 1000} \begin{array}{r} 125 \\ 8 \\ \underline{20} \\ 10 \\ \underline{40} \end{array}$
 $(a+3)^3 + c^3$

HMWK: p 302 #7-10, 19, 20, #37-43 odd, 46-48