Name: _____

Secondary 3 Honors
2-1 Notes Polynomial Operations and Factoring

- **Vocabulary Review**
  - Leading Coefficient: ~~First~~ number in front of the highest powered variable.
  - Powers: exponents ; how many variables
  - Linear Factor: the result after a polynomial has been factored. $(x+2)(x-4)(3x+1)$

Simplify each expression: ADD, SUBTRACT, MULTIPLY

1. $(-6p^4 + 5p^3 - 6p^2 - 4) - (6p^4 + 8p^2 - 8)$	2. $(7p^4 - 4p^3 + 8p - 8) + (8p^4 + 4p^3 - 4p)$
$-12p^4 + 5p^3 - 14p^2 + 4$	$15p^4 + 4p - 8$
3. $(2n^2 + 6n^3 + 8n^4 + 5) - (7 + 4n^2 - 7n^4)$	4. $(4x - 4x^4 + 5x^2 - 5x^3) + (x + 3x^2 + 7x^4)$
$-2n^2 + 6n^3 + 15n^4 - 2$ $15n^4 + 6n^3 - 2n^2 - 2$	$5x + 3x^4 + 8x^2 - 5x^3$ $3x^4 - 5x^3 + 8x^2 + 5x$
5. $(4k + 4)(4k - 4)$	6. $(v - 1)(8v - 4)$
$16k^2 - 16k + 16k - 16$ $16k^2 - 16$	$8v^2 - 4v - 8v + 4$ $8v^2 - 12v + 4$
7. $(-3r^2 + 6r + 1)(-8r^2 - r + 3)$	8. $(x - 7)(-7x^2 - 6x + 8)$
$24r^4 + 3r^3 - 9r^2 - 48r^3$ $-6r^2 + 18r - 8r^2 - r + 3$ $24r^4 - 45r^3 - 23r^2 + 17r + 3$	$-7x^3$ $-6x^2 + 49x^2$ $+ 8x + 42x$ -56 $-7x^3 + 43x^2 + 50x - 56$

Factoring

See how many of these you can factor in 5 minutes on your own.

1) $k^2 - k - 90$

$(k-10)(k+9)$

2) $p^2 - 9p + 14$

$(p-7)(p-2)$

3) $n^2 - n - 56$

$(n-8)(n+7)$

4) $2r^2 - 14r + 24$

$2(r^2 - 7r + 12)$
$2(r-3)(r-4)$

5) $5a^2 + 25a$

$5a(a+5)$

6) $5n^2 - 35n + 60$

$5(n^2 - 7n + 12)$
$5(n-3)(n-4)$

7) $7n^2 + 32n - 60$

$(7n-10)(n+6)$

8) $3p^2 - 7p - 40$

$(3p+8)(p-5)$

9) $5r^2 + 4r - 12$

$(5r-6)(r+2)$

10) $v^2 - 64$

$(v+8)(v-8)$

11) $x^2 - 100$

$(x+10)(x-10)$

12) $x^2 - 1$

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

Special Pattern to know

Difference of Squares

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

Simplify each expression: DIVIDE

1. $\dfrac{7x^3}{35x} = \dfrac{7 \cdot x \cdot x \cdot x}{35 x}$

$\dfrac{}{7 \cdot 5}$

$= \boxed{\dfrac{x^2}{5}}$

2. $\dfrac{16c^4}{24c^2}$

$\boxed{\dfrac{2c^2}{3}}$

3. $\dfrac{2x^2+4x}{x^2-4}$

$\dfrac{2x(x+2)}{(x+2)(x-2)}$

$\boxed{\dfrac{2x}{x-2}}$

4. $\dfrac{4z+1}{4z^2-27z-7}$

$\dfrac{(4z+1)}{(4z+1)(z-7)}$

$\boxed{\dfrac{1}{z-7}}$

5. $(6k^2+k-5) \div (k+1)$

$\dfrac{6k^2+k-5}{k+1}$

$\dfrac{(6k-5)(k+1)}{k+1}$

$= \boxed{6k-5}$

6. $(7c+1) \div (7c^2+50c+7)$

$\dfrac{7c+1}{7c^2+50c+7}$

$(7c+1)(c+7)$

$\boxed{\dfrac{1}{c+7}}$