HW #5 - Due Tuesday, 9/15:
5.1 #63-85 odd

HW #6 - Due Wednesday, 9/16:
5.2 #3-7odd, 15-25odd, 35-49odd

HW #7 - Due Tuesday, 9/22:
5.3 #25-29odd, 43-51odd, 61-67odd, 89-97odd, 109-117odd

HW #8 - Due Friday, 9/25:
5.4 #19-25 odd; 27-43 odd; 55-61 odd
5.5 #21-47 odd

HW #9 - Due Tuesday, 9/29?
5.6 #3-131 odd
5.7 #35-49 odd, 51-57 odd, 61-75odd

Test 3 - Tuesday, 9/29?

Ch 5 - Exponential Expressions & Polynomials
5.1 - Exponential Expressions
5.2 - Intro to Polynomials
5.3 - Multiplying Polynomials
5.4 - Dividing Polynomials
5.5 - Factoring
5.6 - Special Factoring
5.7 - Solving Equations by Factoring

Review:
Multiply the polynomials: $(3x^2 - x^3 + 2x + 1)(4x - 5)$

$12x^3 - 4x^4 + 8x^2 + 4x - 15x^2 + 5x^3 - 10x - 5$

$-4x^4 + 17x^3 - 7x^2 - 6x - 5$

Divide the polynomials: $\dfrac{x + 3x^4 - x^2 + 5x^3 - 2}{x + 2}$ $= 3x^3 - x^2 + x - 1$

$$\begin{array}{r|rrrrr} -2 & 3 & 5 & -1 & 1 & -2 \\ & & -6 & 2 & -2 & 2 \\ \hline & 3 & -1 & 1 & -1 & 0 \end{array}$$

M ____ 1. $a^m a^n$
E ____ 2. a^{-n}
G ____ 3. $(ab)^2$
D ____ 4. $\frac{a^m}{a^n}$
N ____ 5. $(a-b)^2$ $= (a-b)(a-b)$
H ____ 6. $(a^m)^n$
L ____ 7. $\left(\frac{a}{b}\right)^2$
K ____ 8. $(a+b)^2$ $= (a+b)(a+b)$
O ____ 9. a^0
J ____ 10. $(a-b)(a+b)$

A. $a^2 + b^2$
B. a^{n-m}
C. $a^2 + ab + b^2$
D. a^{m-n}
E. $\frac{1}{a^n}$
F. $a^2 - ab + b^2$
G. a^2b^2
H. a^{mn}
I. 0
J. $a^2 - b^2$
K. $a^2 + 2ab + b^2$
L. $\frac{a^2}{b^2}$
M. a^{m+n}
N. $a^2 - 2ab + b^2$
O. 1

11. Write the interval in set-builder notation:
$[-4,1)$
$\{x | -4 \leq x < 1\}$

12. Write the set in interval notation:
$\{x | x > -7\}$
$(-7, \infty)$

13. State the equation of the line passing through the point $(3, -7)$ whose slope is undefined.
$x = 3$

14. State the distributive property of real numbers.
$a(b+c) = ab + ac$

15. A system of equations with a single solution is called independent.
A pair of lines intersecting at a single point is an example of this.

16. A system of equations with no solution is called inconsistent.
A pair of parallel lines (which never intersect) is an example of this.

17. A system of equations with infinitely many solutions is called dependent.
A pair of equations representing the same line is an example of this.

Factor trinomials of the form ax^2+bx+c

When a=1, we look for factors of c that sum to b.

When a is any constant other than 1, we will
- look for factors of c*a that sum to b,
- rewrite bx as a sum of two terms whose coefficients are those factors,
- factor by grouping.

$a^3+b^3 \neq (a+b)^3$

$a^2-b^2 \neq (a-b)^2$

5.6 Special Factoring

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

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

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

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

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

48. $1-125b^3 = 1^3-(5b)^3$

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

$= (1-5b)(1+5b+25b^2)$

54. $27x^3-8y^3$

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

$(3x-2y)(9x^2+6xy+4y^2)$

58. $a^3+(a+b)^3$

$x^3+y^3=(x+y)(x^2-xy+y^2)$

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

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

$\boxed{(2a+b)(a^2+ab+b^2)}$

60. $x^{3n}+y^{3n}$

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

$(x^n)^3+(y^n)^3$

$\boxed{(x^n+y^n)(x^{2n}-x^ny^n+y^{2n})}$

86. $3x^4 - 81x = 3x(x^3 - 27) = 3x(x^3 - 3^3)$

$= 3x(x-3)(x^2+3x+9)$

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

102. $4x^3 + 8x^2 - 9x - 18$

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

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

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

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

108. $8x^4 - 40x^3 + 50x^2$

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

$2x^2(4x^2 - 20x + 25)$

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

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

120. $24a^2b^2 - 14ab^3 - 90b^4$

$12(-45)$

$2 \cdot 2 \cdot 3 \cdot 3 \cdot 3 \cdot 5$

$2b^2(12a^2 - 7ab - 45b^2)$

$2b^2(12a^2 + 20ab - 27ab - 45b^2)$

$2b^2[4a(3a+5b) - 9b(3a+5b)]$

$2b^2(3a+5b)(4a-9b)$

126. $4x^4 - x^2 - 4x^2y^2 + y^2$

$x^2(4x^2-1) - y^2(4x^2-1)$

$(4x^2-1)(x^2-y^2)$

$((2x)^2-1^2)(x^2-y^2)$

$(2x-1)(2x+1)(x-y)(x+y)$

128. $x^6y^3 + x^3 - x^3y^3 - 1$

$x^3(x^3y^3 + 1) - 1(x^3y^3 + 1)$

$(x^3y^3 + 1)(x^3 - 1)$

$(xy+1)(x^2y^2 - xy + 1)(x-1)(x^2+x+1)$

$3 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$

80. $3x^4 + 20x^2 + 32$

$3x^4 + 12x^2 + 8x^2 + 32$

$3x^2(x^2+4) + 8(x^2+4)$

$(x^2+4)(3x^2+8)$