5.1 & 5.2 Quiz IS the homework
if you didn't already finish.
If you didn't, you're shootin' for a 7.

$\S\S.3$

Monomial $x^5 y^6$ is degree 11.

Polynomial $x^4 - 3x^3 + 4x - 5$ is degree 4

Trinomial $x^4 y^3 - 4x^3 y^2 + 21xy$ is degree 7.

Evaluation

$P(x) = x^2 + x + 1 = $ "P of x"

$P(\omega) = \omega^2 + \omega + 1 = $ " " " ω "

$P(3) = 3^2 + 3 + 1 = \boxed{13 = P(3)}$ $\left(\frac{1}{3}\right)^2 = \frac{1^2}{3^2} = \frac{1}{9}$

$P\left(\frac{1}{3}\right) = \left(\frac{1}{3}\right)^2 + \frac{1}{3} + 1$

$\qquad = \frac{1}{9} + \frac{1}{3} \cdot \frac{3}{3} + \frac{1}{1} \cdot \frac{9}{9}$

$\qquad = \frac{1 + 3 + 9}{9} = \boxed{\frac{13}{3} = P\left(\frac{1}{3}\right)}$

Collecting Like Terms

$$3xy - 7x + 7xy - 11$$

$$= 10xy - 7x - 11$$

Addition

$$(x^2 + xy - y^2) + (2x^2 - 4xy + 7y^2)$$

$$= 3x^2 - 3xy + 6y^2$$

$$(x^2 + xy - y^2) - (2x^2 - 4xy + 7y^2)$$

$$= x^2 + xy - y^2 - 2x^2 + 4xy - 7y^2$$

$$= -x^2 + 5xy - 8y^2$$

$$\frac{1}{3}x^2 - \frac{1}{2}x^2y + y^3 + \frac{1}{6}x^2 - \frac{8}{3}x^2y^2 - \frac{2}{3}y^3$$

$$\frac{1}{3}x^2 + \frac{1}{6}x^2 - \frac{1}{2}x^2y + y^3 - \frac{2}{3}y^3 - \frac{8}{3}x^2y^2$$

(i) $\frac{x^2}{3}\cdot\frac{2}{2} + \frac{x^2}{6} - \frac{1}{2}x^2y + \frac{y^3}{1}\cdot\frac{3}{3} - \frac{2y^3}{3} - \frac{8}{3}x^2y^2$

$$= \frac{2x^2+x^2}{6} - \frac{1}{2}x^2y + \frac{3y^3-2y^3}{3} - \frac{8}{3}x^2y^2$$

$$= \frac{3x^2}{6} - \frac{1}{2}x^2y + \frac{y^3}{3} - \frac{8}{3}x^2y^2$$

$$= \frac{1}{2}x^2 - \frac{1}{2}x^2y + \frac{1}{3}y^3 - \frac{8}{3}x^2y^2$$

(ii) $\frac{1}{3}x^2 + \frac{1}{6}x^2 - \frac{1}{2}x^2y + y^3 - \frac{2}{3}y^3 - \frac{8}{3}x^2y^2$

$$= \left(\frac{1}{3} + \frac{1}{6}\right)x^2 - \frac{1}{2}x^2y + \left(1 - \frac{2}{3}\right)y^3 - \frac{8}{3}x^2y^2$$

$$= \left(\frac{1}{3}\cdot\frac{2}{2} + \frac{1}{6}\right)x^2 - \frac{1}{2}x^2y + \left(\frac{3}{3} - \frac{2}{3}\right)y^3 - \frac{8}{3}x^2y^2$$

$$= \frac{3}{6}x^2 - \frac{1}{2}x^2y + \frac{1}{3}y^3 - \frac{8}{3}x^2y^2$$

$$= \frac{1}{2}x^2 - \frac{1}{2}x^2y + \frac{1}{3}y^3 - \frac{8}{3}x^2y^2$$

Factoring out GCF

$$3x + 6$$

$$= 3x + 3 \cdot 2$$

$$= 3(x + 2)$$

$3\underline{)6}$
$\quad 2$

$GCF = 3$

$$42x - 54$$
$$= 6 \cdot 7x - 6 \cdot 9$$
$$= 6(7x - 9)$$

$2\underline{)42}$ $2\underline{)54}$
$3\underline{)21}$ $3\underline{)27}$
$\quad 7$ $3\underline{)9}$
          3

$$GCF = 6$$

old

$$\frac{42}{6} = 7 \qquad \frac{54}{6} = 9$$

$$(2x + 3)(x - 7) = 2x^2 - 11x - 21$$

New

$$2x(x+4) - 7(x+4) = (2x-7)(x+4)$$

$$= (x+4)(2x-7)$$

$$(x+4)\left(\frac{2x(x+4)}{x+4} - \frac{7(x+4)}{x+4}\right)$$

This method can be handy for weird-looking ones.

$$= (x+4)(2x-7)$$

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

$$= 4x^2y^3 + 4x^3y^2 - 12xy$$

$$(y+5)(3y-2) = 3y^2 - 2y + 15y - 10 = 3y^2 + 13y - 10$$

$$(y+5)(y^2 - 3y + 7)$$

Apply Distributive Law.

$$= y^3 - 3y^2 + 7y$$
$$+ 5y^2 - 15y + 35$$
$$\overline{\qquad\qquad\qquad}$$
$$y^3 + 2y^2 - 8y + 35$$

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

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

Special Products to MEMORIZE

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

Next time: 5.5, 5.6
    Encouraged to view Factoring Slideshow
we started, today
      5.3, 5.4 due Friday.