INTERMEDIATE ALGEBRA

GPS # 18 **5.2 MULTIPLICATIONS OF POLYNOMIALS** **NAME:** Parul Patel

Useful Definitions:

* To multiply polynomials, simply multiply each term of the first polynomial to each term of the other. Example: $(x^2+2x)(7x^2-5x+3) = x^2(7x^2-5x+3)+2x(7x^2-5x+3)$

* **Special Products:**

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

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

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

Note:

$(x+y)^2 \neq x^2+y^2$

$(x-y)^2 \neq x^2-y^2$

Evaluate the following:

a) $(x^2+3x)(2x^2+3x+1)$

$= x^2(2x^2+3x+1)+3x(2x^2+3x+1)$

$= 2x^4+3x^3+x^2+6x^3+9x^2+3x$

$= 2x^4+9x^3+10x^2+3x$

b) $(2m+3)(m^2-3m-4)$

$= 2m(m^2-3m-4)+3(m^2-3m-4)$

$= 2m^3-6m^2-8m+3m^2-9m-12$

$= 2m^3-3m^2-17m-12$

c) $(2t-3)(4t-1)$

$= 2t(4t-1)-3(4t-1)$

$= 8t^2-2t-12t+3$

$= 8t^2-14t+3$

see other method in Back

d) $(a-3)(a+3)$

$= a(a+3)-3(a+3)$

$= a^2+3a-3a-9$

$= a^2-9$

e) $(x-5)(x-5)$

$= x(x-5)-5(x-5)$

$= x^2-5x-5x+25$

$= x^2-10x+25$

f) $(2p+8)(2p+8)$ Inner to Inner & (Foil) outer to outer method

$= 4p^2+16p+16p+64$

$= 4p^2+32p+64$

g) $(x+2)(x-2)$ (Foil)

x^2-4

h) $(3x-2)(x-4)$ (Foil)

$= 3x^2-12x-2x+8$

$= 3x^2-14x+8$

i) $(x+2)^2 \Rightarrow (x+2)(x+2)$

x^2+4x+4

j) $(3x-2)^2 \Rightarrow (3x-2)(3x-2)$

$9x^2-12x+4$

k) $(3-5x)^2$

$= 9-30x+25x^2$

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

$= -2x(9x^2-12x+4)$

$= -18x^3+24x^2-8x$