Homework 5: Due Friday 10/12/18
BLC150–Algebra Workshop

Name: Me

Exercise 5.1a: Multiply out the following and simplify when possible [Mostly distribution.]

E.g. $3x(x-y) = 3x^2 - 3xy$	a) $5(x+2y) =$ $5x+10y$
b) $2x(x+y) =$ $2x^2+2xy$	c) $(x-y)3x =$ $3x^2-3xy$
d) $r(-3+x) =$ $-3r+rx$ or $rx-3r$	e) $r^3(x-3) =$ r^3x-3r^3

Exercise 5.1b: Factor out the Greatest Common Factor.

E.g. $3x^2 - 3xy = 3x(x-y)$	f) $2x^2+2xy =$ $2x(x+y)$
g) $r^3x - 3r^3 =$ $r^3(x-3)$	h) $rx - 3r =$ $r(x-3)$
i) $3x^2 - 3xy - 3 =$ $3(x^2-xy-1)$	j) $5x + 10y =$ $5(x+2y)$
k) $10x^2 - 12xy - 2x =$ $2x(5x-6y-1)$	l) $10x^8 + 20x^4 - 40x^2y^2 =$ $10x^2(x^6+2x^2-4y^2)$

Exercise 5.2a: Using FOIL, multiply these quadratics out and simplify to the form $x^2 \pm bx \pm c$.

E.g. $(x+2)(x-5) = x^2 - 3x - 10$	a) $(x+3)(x-3) =$ $x^2-3x+3x-9 = x^2-9$
b) $(x+4)(x+5) =$ $x^2+5x+4x+20 = x^2+9x+20$	c) $(x-7)(x+7) =$ $x^2+7x-7x-49 = x^2-49$
d) $(4+x)(x+5) =$ $4x+20+x^2+5x = x^2+9x+20$	e) $(x+7)(x+7) =$ $x^2+7x+7x+49 = x^2+14x+49$
f) $(x-4)(x-5) =$ $x^2-5x-4x+20 = x^2-9x+20$	g) $(x+y)(x-y) =$ $x^2-xy+xy-y^2 = x^2-y^2$
h) $(4-x)(5-x) =$ $20-4x-5x+x^2 = x^2-9x+20$	i) $(x+6)(x-6) =$ $x^2-6x+6x-36 = x^2-36$
j) $(-x+4)(-x+5) =$ $x^2-5x-4x+20 = x^2-9x+20$	k) $(x+6)(x+6) =$ $x^2+6x+6x+36 = x^2+12x+36$

Exercise 5.2b: Factor these quadratics into the form $(x \pm a)(x \pm b)$. Use scrap paper if necessary.

E.g.1) $x^2 - 3x - 10 = (x + 2)(x - 5)$

E.g.2) $x^2 - 81 = (x + 9)(x - 9)$

l) $x^2 - 36 =$ $(x+6)(x-6)$

$6 \cdot (-6) = -36$

m) $x^2 + 9x + 20 =$ $(x \pm ?)(x \pm ?)$ $(x+5)(x+4)$

$5 \cdot 4 = 20$

$5 + 4 = 9$

n) $x^2 - 49 =$ $(x+7)(x-7)$

$7 \cdot (-7) = -49$

o) $x^2 - 9x + 20 =$ $(x \pm ?)(x \pm ?)$ $(x-5)(x-4)$

$-5 \cdot (-4) = 20$

$-5 + (-4) = -9$

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

$3 \cdot (-3) = -9$

q) $x^2 + 12x + 36 =$ $(x\ \ )(x\ \ )$ $(x+6)(x+6) = (x+6)^2$

$6 \cdot 6 = 36$

$6 + 6 = 12$

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

$y \cdot (-y) = -y^2$

s) $x^2 + 14x + 49 =$ $(x+7)^2$

$7 \cdot 7 = 49$

$7 + 7 = 14$

t) $10x^2 - 90 =$ $10(x^2-9)$ $= 10(x+3)(x-3)$

Hint: Factor out a 10 first. The final form will be 10(x-?)(x+?)

u) $2x^2 + 18x + 40 =$ $2(x^2+9x+20)$ $2(x+5)(x+4)$

Hint: Factor out the Greatest Common Factor first, then proceed.

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

$1 \cdot 1 = 1$

$1 + 1 = 2$