MTH 28.5 LECTURE NOTES (Ojakian)

Topic 6: Simplest Simplifying - Combining like terms and expanding

OUTLINE References (1.1, 1.2, 1.3, 1.5)

- 1. Expressing quantities with algebra
- 2. Simple Simplifying
 - (a) Combining Like Terms
 - (b) Expanding using distributivity

1. Using algebra to express quantities

Express the following WITHOUT calculating.

- (a) 20 more than 5
- (b) 20 more than x
- (c) 20 more than an unknown number
- (d) The sum of two unknowns.
- (e) 10 less than 40 $\,$
- (f) 10 less than y
- (g) Double 51.
- (h) Double an unknown
- (i) Half of 10

- (j) Half of an unknown
- (k) 3 times an unknown
- (l) The difference between 8 and 3
- (m) The difference between x and 3
- (n) The product of 5 and $\frac{3}{17}$
- (o) The product of 5 and an unknown.
- (p) The quotient of 10 and 2
- (q) The quotient of an unknown and 2

2. <u>Two Tricks</u>

Do for now and later return to why they work!

- (a) First "magic" trick.
 - i. Pick any number (call this your "original" number).
 - ii. Double your number.
 - iii. Add 5 to your last result.
 - iv. Double your last result.
 - v. Find 4 times your original number and subtract that from your last result.
 - vi. Now I'll guess your number...
 - vii. Question: How does this work?
- (b) Another "magic" trick.
 - i. Pick any positive whole number (call this your "original" number).
 - ii. Add one to your number.
 - iii. Square your last result.
 - iv. Subtract one from your last result.
 - v. Divide your last result by your original number.
 - vi. Tell me your result, and I'll guess your original number.
 - vii. Question: How does this work?

3. Distributing

(a) $5(2y+3) =$	(e) $5(-2y-3) =$
(b) $5(2y-3) =$	(f) $\frac{2}{3}(3x+1) =$
(c) $-5(2y+3) =$	0
(d) $-5(2y-3) =$	(g) $(3-6x)\frac{1}{3} =$

NOTE: Pick some numbers to evaluate the BEFORE and the AFTER.

- 4. Combining Like Terms
 - (a) 5x + 3 + 4x + 2 =(b) 7y - 9 + y + 7 - 27 =(c) 10 + 3A - 15 - 7A =(d) $\frac{1}{3} + \frac{3}{4}x + \frac{4}{3} - \frac{1}{4}x =$

NOTE: Pick some numbers to evaluate the BEFORE and the AFTER.

5. Distributing AND Combining

(a) $5 + 4(2x + 3) =$	(c) $5x + 4(2x + 3) =$
(1) $(0, 1, 0)$	$(1) \mathbf{r}(1) + \mathbf{n}(0) = 0$

(b) 5 - 4(2x + 3) = (d) 5(1 - x) + 3(2x - 2) =