ALGEBRA 1/2 Review for Incoming Alg 3/4 Students. This work must be completed by 3rd day of class in the fall! This is meant to be done over the course of the summer (not at the last minute). For those problems you cannot do, we will review them the first two days.

PART I. GENERAL ALGEBRA

Simplify the expressions below using the **Order of Operations**:

1. $(5-2)^2-(7-1)$

2. $(1+3^2)\bullet 3-(1-4)$

Simplify the expressions below by combining like terms:

3. $2x^2+8-2y^2+7x-6x^2-3y-9+2y^2+3x$

4. $2-(3b+6)+2b-6$

5. $x^2-(x^2+2x-4)+(4-3x^2-3x)$

Evaluate the following:

6. Find y when x=2 $y=(5-x)(4x-3)-5$

7. Find m when k=-3 $m=(k^2-5)^2-(k+1)+2k$

Solve the following equations for x:

8. $7 + x = 20$

9. $3x - 2 = 7$

10. $3 + 3x - 5 = -8x + 2 - 2x + 3^2$

11. Use the **rule** below to complete the following problems.

$$y = -3x + 1$$

a. Complete the **table**:

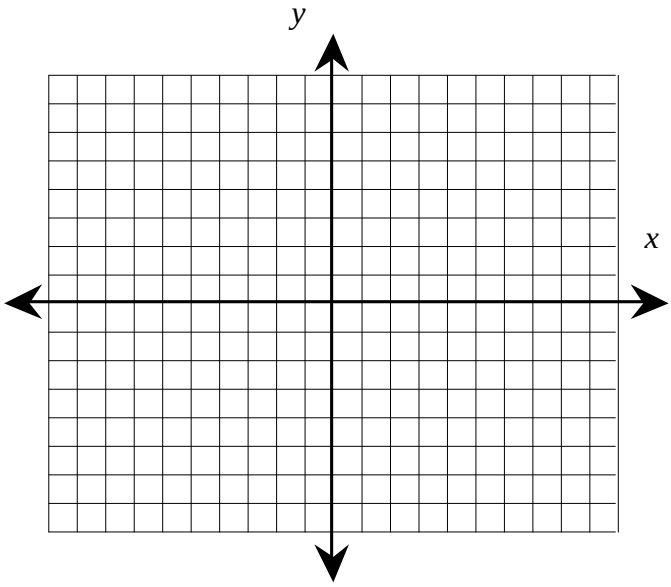
IN *(x)*	−3	−2	-1	0	1	2	3
OUT *(y)*							

b. **Graph** the line represented by the table and rule. Label your scale.

c. What is the <u>slope</u> of the line?

d. Where is the <u>*y*-intercept</u>? (answer in (x,y) form)

e. Where is the <u>*x*-intercept</u>? (answer in (x,y) form)



12. Use your pattern-detection skills and the table below to complete the following problems. Assume that the graph of the rule is a straight line.

IN *(x)*	-3	−2	−1	0	1	2	3
OUT *(y)*	-4		0				8

a. Complete the **table**:

b. Describe any **patterns** you notice for x and y.

b. Find a **rule** that relates the input value, *x*, to the output value, *y*. Write your rule using "*y*=" form.

Simplify the expressions below using the **Order of Operations**:

1. $(8-4)^2-(5-2)$

2. $\left(2-3^2\right)-(1-6)\bullet 5$

Simplify the expressions below by combining like terms:

3. $5x^2+2x-4-3y^2-3x^2+x-4+4x^2$

4. $1-(2k+8)+k-8$

5. $2y^2-\left(y^2+2y-3\right)+\left(3-4y^2-4y\right)$

Evaluate the following:

6. Find t when v=2 $t=(v-4)(3v-2)+7$

7. Find p when m=-3 $p=\left(5-m^2\right)^2-(m+2)+3m$

Solve the following equations for x:

8. $x-6=15$

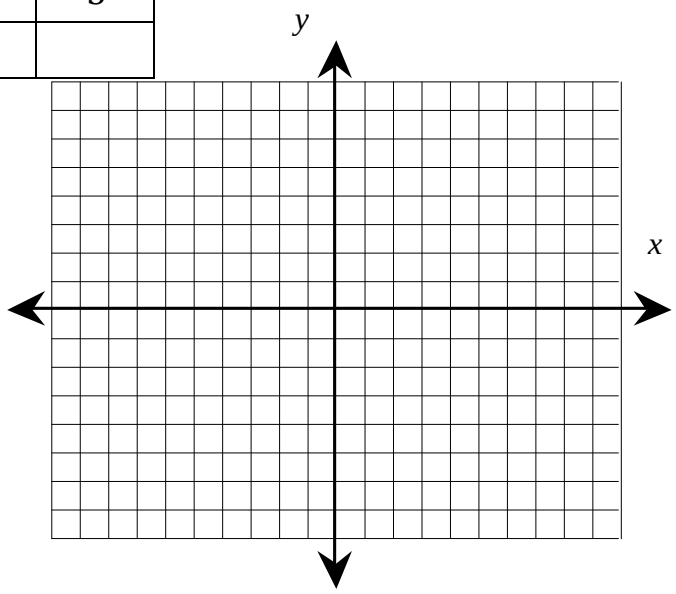
9. $5x+3=17-2x$

10. $3-(2x+7)=7x-(5-x)-(3)^2$

11. Use the **graph** below to complete the following problems.

f. Complete the **table**:

IN *(x)*	−3	−2	-1	0	1	2	3
OUT *(y)*							



g. Where is the <u>*y*-intercept</u>? (answer in (x,y) form)

h. Where is the <u>*x*-intercept</u>? (answer in (x,y) form)

i. Find a **rule** that relates the input value, x, to the output value, y. Write your rule in "$y=$" form.

12. Use your pattern-detection skills and the table below to complete the following problems. Assume that the graph of the rule is a straight line.

c. Complete the **table**:

b. Describe any **patterns** you notice for x and y.

d. Find a **rule** that relates the input value, *x,* to the output value, *y.* Write your rule using "*y*=" form.

Simplify the expressions below using the **Order of Operations**:

1. $2(4-1)^2-3+5\bullet 2$

2. $(10-4^2)-(1+3)\bullet 2$

IN *(x)*	-3	−2	−1	0	1	2	3
OUT *(y)*		0		1			2.5

Simplify the expressions below by combining like terms:

3. $x^2+2x+5+2x^2-2x-6-2x^2+1$

4. $4-(3z+5)+4z-6$

5. $2x-\left(x+4x^2-1\right)+\left(-1+4x^2+2x\right)$

Evaluate the following:

6. Find y when x=2 $y=(x+1)(3x-2)+5$

7. Find w when t=-3 $w=\left(-2t-9\right)^2-(t+1)+3t$

IN *(x)*	-3	–2	-1	0	1	2	3
OUT *(y)*							

Solve the following equations for x:

8. $6+x=17$

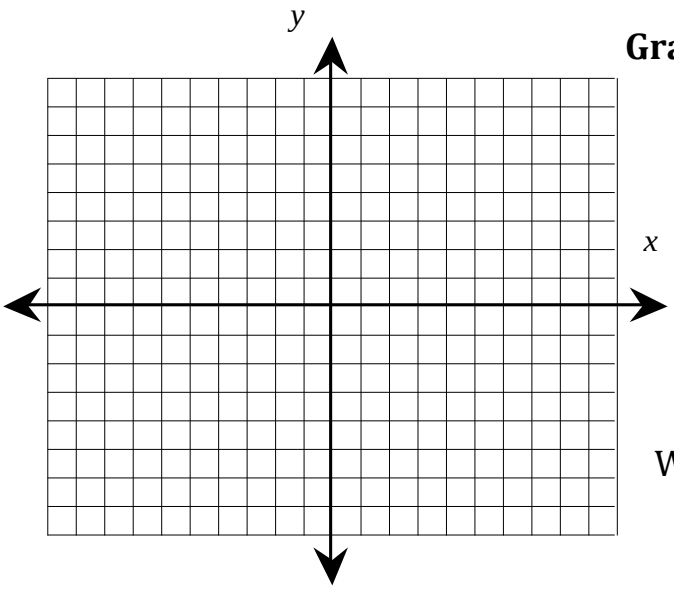
9. $3x-2=13$

10. $4-(x+8)=-6x+(3x-2)-3$

11. Use the **rule** below to complete the following problems.

$$y=-2x+1$$

Complete the **table:**



Graph the line represented by the table:

Where is the *y*-intercept? (answer in (x,y) form)

What is the slope/growth factor of the line?

PART 2: RATIONALS, QUADRATICS, ABSOLUTE VALUE etc.

Simplification of rational expressions:

1. Evaluate each expression for the given **x = 8.** Box answers.

Example

$$5-\frac{36}{x}$$

Plug in 8 for x (from directions)

$$5-\frac{36}{8}=4.5$$

a. $\frac{x+1}{2x}$

b. $\sqrt{3x+26}$

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

d. $-2|5-x|$

f. $3\sqrt[3]{x}$

e. x^2-2x+2

2. **Expand Completely**. Box answers.

Example: $(x+3)^2 = x^2+6x+9$

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

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

b) $x(x-1)$

3. **Factor Completely .** Box answers.

Example: $16x^2-9=(4x-3)(4x+3)$

b) $4x^6+20x^5-24x^4$

c) x^2-x

d) x^2+6x+9

4. Simplify the following expressions (if possible). Box answers.

a) $3x+7-2x+3+y(y^2-1)$

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

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

d) $\frac{x^2}{3}-\frac{2x^2}{7}-x$

5. Solve the following equations for the variable indicated. Box answers.

a) $-2x+5=\frac{1}{4}$

b) $\frac{3}{2}x+\frac{1}{4}x=2$

c) $\sqrt{x}=6$

d) $3x+\frac{1}{y}=3(\textit{for}\ \ y)$

3. Solve the following systems of equations algebraically. Express your answers as order pairs (x, y).
Check y

1. Evaluate each expression for the given **x = 8.** Box answers.

g. $5-\frac{36}{x}$

h. $\frac{x+1}{2x}$

i. $\sqrt{3x+26}$

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

k. $-2|5-x|$

l. x^2-2x+2

m. $3\sqrt[3]{x}$

2. **Expand Completely**. Box answers.

a) $(x+3)^2$

b) $x(x-1)$

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

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

3. **Factor Completely .** Box answers.

a) $16x^2-9$

b) $4x^6+20x^5-24x^4$

c) x^2-x

d) x^2+6x+9

4. Simplify the following expressions (if possible). Box answers.

a) $3x+7-2x+3+y(y^2-1)$

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

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

d) $\frac{x^2}{3}-\frac{2x^2}{7}-x$

5. Solve the following equations for the variable indicated. Box answers.

b) $-2x+5=\frac{1}{4}$

b) $\frac{3}{2}x+\frac{1}{4}x=2$

c) $\sqrt{x}=6$

d) $3x+\frac{1}{y}=3(\textit{for}\quad y)$

6. Solve the following systems of equations algebraically. Express your answers as order pairs (x, y). Check your answers. Box answers.

a. $4x-4y=-8$
$2y+3x=6$

1. Evaluate each expression for the value **x = 6**. Box answers.

n. $x(x-3)$

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

p. $-3x^2-3x-5$

q. $x(\frac{3}{9})-(x)(\frac{1}{3})$

r. $5|x-2|$

s. $2\sqrt{\frac{x}{24}}$

t. If x = rq (r times q), evaluate for x:
$2x^2-2x+1$

2. **Expand completely**. Box answers.

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

b) $(-x-2y)(x+4)$

c) $(x-4)(x+4)$

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

3. **Factor completely**. Box answers.

a) $16x^2 - 25$

b) $8x^3 + 20x^5 - 24x^4$

c) $y^4 - y^2$

d) $2x^2 + 5x - 12$

4. Simplify the following expressions (if possible). Box answers.

a) $8x - 5 + 2x + 3 + y$

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

c) $4(x-3)^2 + 2(x-2)^2$

d) $\frac{x^2}{3} + \frac{4x^2}{2} - \frac{x}{12}$

5. Solve the following equations for the variable indicated. Box answers.

c) $-2x - 5 = \frac{1}{4}$

b) $\frac{3}{2}x + \frac{1}{4}x = \frac{4}{3}$

c) $\frac{\sqrt{x}}{2} = 2$

d) $4x - \frac{1}{y} = 3 \; (for \;\; y)$

6. Solve the following systems of equations algebraically. Express your answers as order pairs (x, y). Check your answers. Box answers.

b. $2x - 2y = -2$
$2y + 3x = 12$