

Algebra 1/2

Semester 2

Name KEY

Final Retention Exam Review

Period _____ Date _____

Units of Study:	Worksheets:	Quizzes & Tests:
Unit 6 Systems of Equations	#1 - 8	Quiz 6 & Test 6
Unit 7 Inequalities	#10 - 13	Test 7
Unit 8 Exponents & Exponential Functions	#15 - 22	Quiz 8 & Test 8
Unit 9 Quadratics	#24 - 37	Tests 9 Part 1 & 2

Unit 6 Learning Targets: Systems of Equations

- I can model linear systems in multiple ways (equations, graphs, tables).
- I can solve linear systems using algebra (equal values, substitution, elimination).
- I can solve any system using graphing.

No Evidence (1)

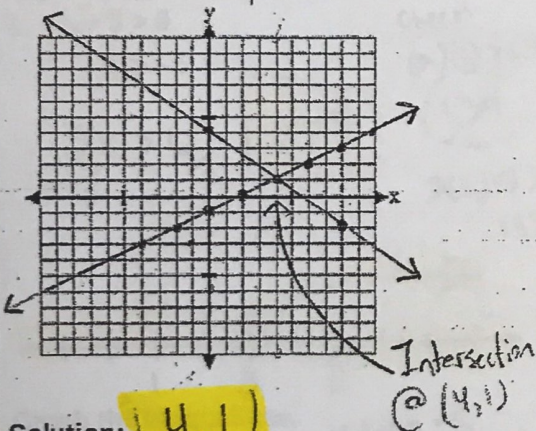
Working Towards (2)

Close to Proficient (2.5)

Proficient (3)

Solve by graphing.

1. $y = \frac{1}{2}x - 1$ y int = -1 Slope = $\frac{1}{2}$
 $y = -\frac{3}{4}x + 4$ y int = 4 Slope = -4



Solution: (4, 1)

Solve by making a table.

2. $y = 4x - 6$
 $y = -6x + 14$

x	$y = 4x - 6$	$y = -6x + 14$
0	-6	14
1	-2	8
2	2	2
3	6	-4
4	10	-10

Solution: 2, 2

Solve by substitution.

3. $y = -x - 7$
 $5y + 3x = -13$

$5(-x - 7) + 3x = -13$ Substitute
 $-5x - 35 + 3x = -13$ CLT
 $-2x - 35 = -13$
 $+2x$ $+2x$
 $-35 = 2x - 13$
 $+13$ $+13$
 $-22 = 2x$ $\div 2$
 $-11 = x$ $\div 2$
 $x = -11$
 $y = -(-11) - 7$
 $y = 11 - 7$
 $y = 4$
(-11, 4)

Solve by elimination

4. $c + b = -11$ → Multiply by 3 → $3c + 3b = -33$
 $3c - 6b = -6$

$3c + 3b = -33$
 $-3c - 6b = -6$
 $-3b = -39$
 $\div -3$ $\div -3$
 $b = 13$
 $c + 13 = -11$
 $c = -11 - 13$
 $c = -24$
(-24, 13)

Solve using any method.

add to divide

$$\begin{array}{r} 5. \quad -3x - 4y = 2 \\ \quad \quad 3x + 3y = -3 \\ \hline \end{array}$$

$$-y = -1$$

$$y = 1$$

substitute

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

$$-3x - 4 = 2$$

$$-3x = 6$$

$$x = -2$$

(-2, 1)

6. $2x + 2y = 18$
 $x = 3 - y$

$$2(3 - y) + 2y = 18$$

$$6 - 2y + 2y = 18$$

$$6 = 18$$

No solution

STOP and check your answers for Unit 6 on page 1. Give yourself a score, and then fix any errors.

Unit 7 Learning Targets: Inequalities	No Evidence (1)	Working Towards (2)	Close to Proficient (2.5)	Proficient (3)
<ul style="list-style-type: none"> - I can create inequalities in one variable to represent constraints and solve problems. - I can use inequalities to determine which points are viable solutions - I can graph the solutions to one-variable inequalities on the number line and a system of linear inequalities of two half-planes. 				

Solve and graph the inequalities.

1. $2x + 3 > 9$
 $2x > 6$
 $x > 3$

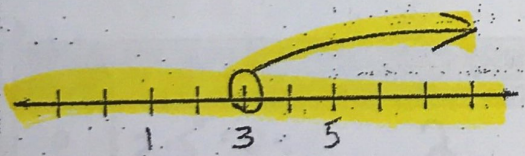
$x > 3$

check

$$(2)(3) + 3 > 9$$

$$6 + 3 > 9$$

$$9 > 9 \quad \downarrow$$



2. $-3x + 4 \geq 7$
 $-3x \geq 3$
 $x \leq -1$

$x \leq -1$

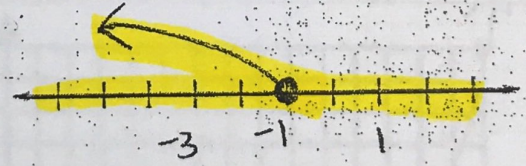
Switch symbol!

check

$$-3(-3) + 4 \geq 7$$

$$9 + 4 \geq 7$$

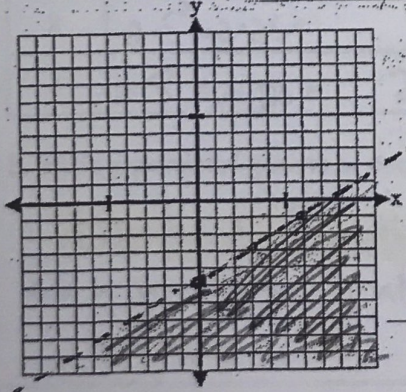
$$13 \geq 7 \quad \checkmark$$



Graph the inequalities.

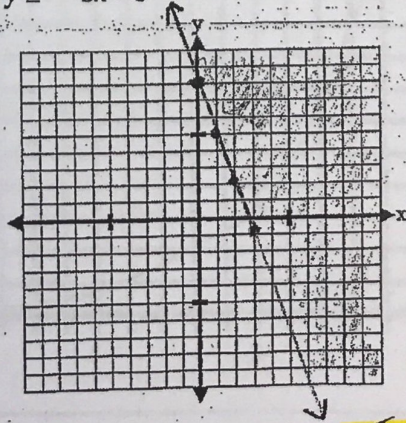
3. $y < \frac{2}{3}x - 5$

y int = -5
Slope = $\frac{Rise}{Run} = \frac{2}{3}$



4. $y \geq -3x + 8$

y int = 8
Slope = $\frac{Rise}{Run} = \frac{-3}{1}$



check (3, 0)

$$0 \geq -3(3) + 8$$

$$0 \geq -7 \quad \checkmark$$

5. Identify one solution for #4: **5, 0** or

anything in the shaded Area

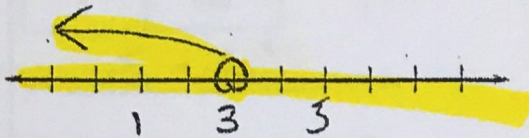
Solve and graph the inequality.

6. $5 > 2x - 10 + 3x$

$$5 > 5x - 10$$

+10 +10

$$15 > 5x \quad 3 > x \text{ or } x < 3$$



Solve the system of inequalities.

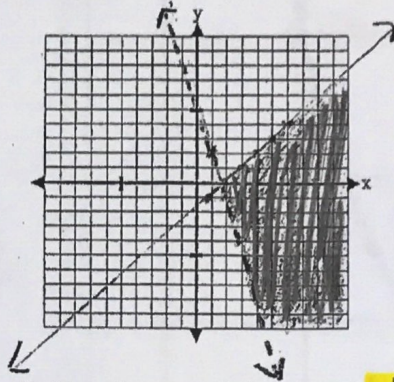
7. $3x + y > 5$ Convert to $y = mx + b$
 $y \leq x - 2$

$$3x + y > 5$$

$$-3x \quad -3x$$

$$y > -3x + 5$$

$y \text{ int} = 5$
 Slope = $\frac{\text{rise}}{\text{run}} = \frac{-3}{1}$



$y \leq x - 2$ $y \text{ int} = -2$
 Slope = 1

8. Identify one solution for #7: **5, 0**

Check 5, 0
 $3(5) + 0 > 5$
 $15 > 5 \checkmark$
 $0 \leq 5 - 2$
 $0 \leq 3 \checkmark$

STOP and check your answers for Unit 7. Give yourself a score, and then fix any errors.

Unit 8 Learning Targets: Exponents & Exponential Functions

- I can write, represent, evaluate, and solve exponential functions using a table, graph, or situation.
- I can explain the properties of negative, fractional, and zero exponents
- I can identify which situations can be modeled with an exponential function.

No Evidence (1)

Working Towards (2)

Close to Proficient (2.5)

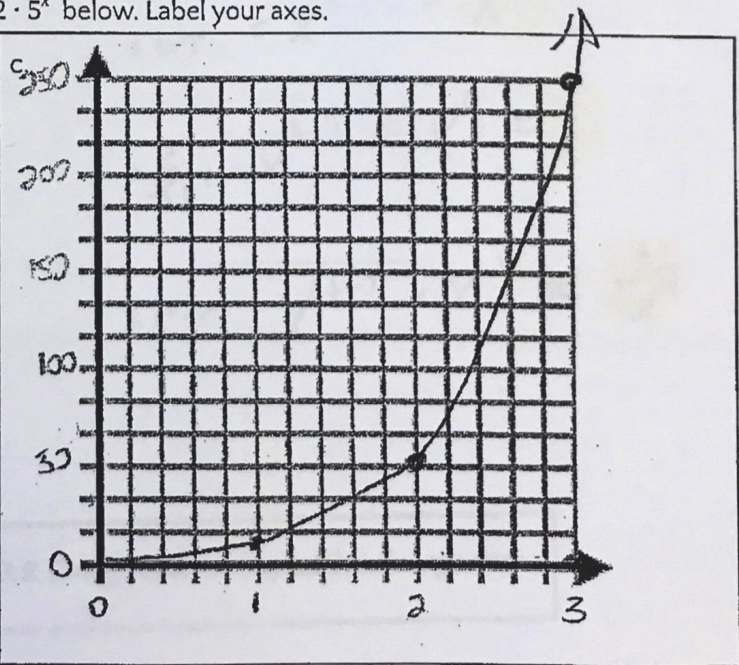
Proficient (3)

C Level

1. Complete the table and graph the equation $y = 2 \cdot 5^x$ below. Label your axes.

a.

x	$y = 2 \cdot 5^x$
0	$2 \cdot 5^0 = 2 \cdot 1 = 2$
1	$2 \cdot 5^1 = 2 \cdot 5 = 10$
2	$2 \cdot 5^2 = 2 \cdot 25 = 50$
3	$2 \cdot 5^3 = 2 \cdot 125 = 250$



b. Is this exponential growth or decay? Explain.

Exponential Growth because as x increases, y also increases.

2. For each of the problems below, write an equation.

x	y
0	0.5
1	3
2	18
3	108

$y_{int} = .5$
 Growth factor = 6
 $y = .5 \times 6^x$
 ↑ y_{int} ↑ Growth factor

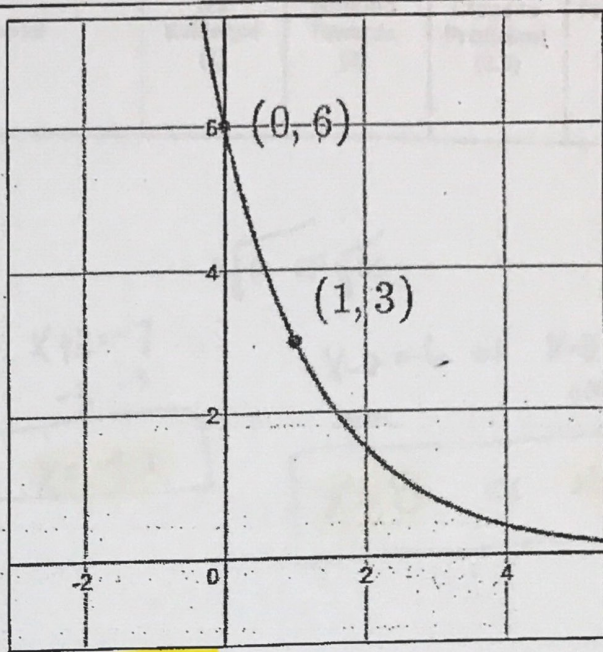
$y = .5 \cdot 6^x$

Check that your equation works:

$(2, 18)$
 $18 = .5 \times 6^2$

$18 = .5 \times 36$

$18 = 18 \checkmark$



$y = 6 \cdot .5^x$

$y_{int} = 6$
 Growth factor = .5

3. Use exponent properties to simplify the following expressions. Your answers should have no negative or zero exponents, and should be as simple as possible.

a. $x^2 \cdot x^3 = x^{2+3} = x^5$

b. $\frac{x^5}{x^2} = x^{5-2} = x^3$

c. $x^{-3} \cdot x^7 = x^{-3+7} = x^4$

d. $(x^3)^4 = x^{3 \cdot 4} = x^{12}$

e. $\frac{x^4}{x^4} = x^{4-4} = x^0 = 1$

f. $x^3 \cdot x^{-7} = x^{3+(-7)} = x^{-4} = \frac{1}{x^4}$

STOP and check your answers for Unit 8. Give yourself a score, and then fix any errors.

Solve:

1. $x^2 + 6x + 8 = 0$

$(x+2)(x+4) = 0$

$x+2=0$ or $x+4=0$
 $-2 \quad -2$ $-4 \quad -4$

$x = -2$ or -4

Change to Standard Form by multiplying:

3. $y = (x-3)(x-4)$

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

$y = x^2 - 7x + 12$

$y = x^2 - 7x + 12$

Proficient (3)/Highly Proficient(4):

Solve by factoring:

5. $2x^2 - 6x - 8 = 0$

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

$2(x-4)(x+1) = 0$

$x = 4$ or $x = -1$

Change to Standard Form:

7. $y = -3(x+4)^2 - 3$

Expand first

$y = -3(x-4)(x-4) - 3$ EWE

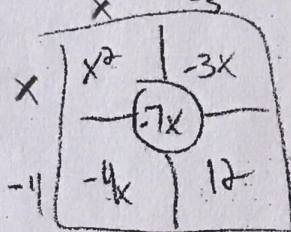
$y = -3(x^2 - 8x + 16) - 3$ EWE

$y = -3x^2 + 24x - 48 - 3$

$y = -3x^2 + 24x - 51$

2. $x^2 - 7x + 12 = 0$

$(x-3)(x-4) = 0$



$x-3=0$ or $x-4=0$
 $+3 \quad +3$ $+4 \quad +4$

$x = 3$ or 4

4. $y = (x+4)^2$

$y = (x+4)(x+4)$

$y = x^2 + 4x + 4x + 16$

$y = x^2 + 8x + 16$

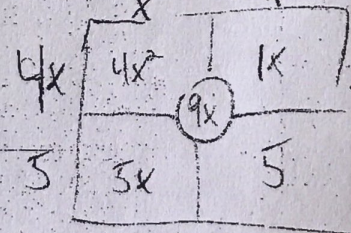
3. $x^2 - 17x = 0$

$x(x-17) = 0$

$x = 0$ or $x-17=0$
 $+17 \quad +17$

$x = 0$ or $x = 17$

6. $4x^2 + 9x + 5 = y$



$y = (4x+5)(x+1)$

$4x+5=0$ or $x+1=0$
 $-5 \quad -5$ $-1 \quad -1$

$\frac{4x}{4} = \frac{-5}{4}$

$x = \frac{-5}{4}$ or -1

For problems #8-9, change to Vertex Form:

8. $y = x^2 + 6x + 8$

$6 \div 2 = (3)^2 = 9$

9. $y = x^2 - 4x - 3$

$-4 \div 2 = (-2)^2 = 4$

STOP and check your answers for Unit 9. Give yourself a score, and then fix any errors.

8. $y = (x^2 + 6x + 9) + 8 - 9$

$y = (x^2 + 6x + 9) - 1$

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

9. $y = (x^2 - 4x + 4) - 3 - 4$

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

$y = (x-2)^2 - 7$