

Name:

Date:

Hour:

Algebra 1  
Semester 1 Final Review WS

**Unit 1 – Equations and Inequalities**

Simplify each radical expression.

1.  $-2\sqrt{24}$

2.  $6\sqrt{54}$

3.  $\sqrt{72}$

4. Solve for x:  $4(x - 2) + 6x = 12 + 5x$ .

5. Write and solve an equation to represent the following:  
The difference of twice a number and 4 is 8

Solve each equation.

6.  $3(2x - 5) = 2(3x - 2)$

7.  $4x - 3 = 2x + 5$

8.  $\frac{2}{3}x - 6 = \frac{4}{5}$

9. On the first day of the year, Alicia has \$1000 in her savings account and started spending \$25 a week. Her sister Kelsey had \$650 in her savings account and started saving \$15 a week. After how many weeks will the sisters have the same amount? What will that amount be?

10. Solve the equation. Write a justification for each step.

Statements	Reasons
$25 = 5(x - 3)$	

Solve each inequality. Then graph.

11.  $-125 \geq 8p - 5$

12.  $9 + \frac{x}{3} > 13$

13.  $98 < 7(3x + 5)$

14.  $-5(n + 1) - 6n \leq 83$

15.  $6x - 5(8 - 5x) < 16 + 3x$

16.  $3(x + 1) \geq 2(-2 + x)$

Solve each compound inequality and graph its solution.

17.  $33 > -8x - 7 \geq -79$

18.  $-15 < -3(x - 2) < 33$

19.  $-7x + 7 > 42$  or  $2 - x \leq -2$

20.  $8x - 4 \geq 20$  or  $5x - 1 \leq 4$

21. A number  $x$  is more than  $-6$  and at most  $8$ . Write this sentence as an inequality. Graph the solutions.

22. You start a small baking business, and you want to earn a profit of at least  $\$250$  in the first month. The expenses in the first month are  $\$155$ . Write and solve an inequality to represent the possible revenues that you need to earn to meet the profit goal?

23. Your monthly budget allows you to spend between  $\$200$  and  $\$450$ , inclusively. You have already spent  $\$125$ . Write and solve a compound inequality to represent how much more money you have to spend for the rest of the month.

Simplify each.

24.  $2x^4 \cdot 3x^{-1}$

25.  $\frac{x}{4x^{-1}}$

26.  $x^3 \cdot 4x^3$

27.  $3x^0 \cdot x^2 y^3$

28.  $\frac{3x^{-3}}{3x^{-4}}$

29.  $\frac{n^{-1}}{4n^2}$

30.  $\frac{2r}{r^3}$

31.  $\frac{2a^{-4}}{a^{-3}}$

**Unit 2 – Functions**

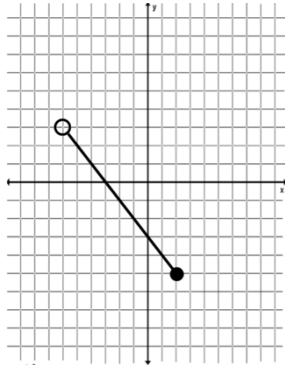
1. Find the domain and range of each relation.

a.  $\{(1, 5), (-1, 3), (2, 7), (8, 10), (-2, 3)\}$

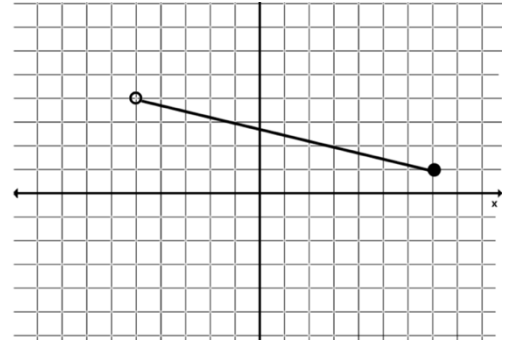
c.

<b>x</b>	-3	-1	0	1	3
<b>y</b>	2	6	10	14	18

b.



d.



2. Using the examples in #1, determine if each represents a linear function. Explain your reasoning.

a. \_\_\_\_\_

b. \_\_\_\_\_

c. \_\_\_\_\_

d. \_\_\_\_\_

3. If  $f(x) = 3x - 5$  and  $g(x) = 3 - 5x$ , evaluate each of the following.

a.  $g(-3)$

b.  $f(4)$

c.  $g(2) - f(-1)$

4. Alan pays Comcast \$5 per movie rental plus an \$80 fee.

a. Write a function, in function notation, to represent Alan's total bill.

b. How much is Alan's bill if he rents 6 movies?

c. If Alan's bill was \$130, how many movies did he rent?

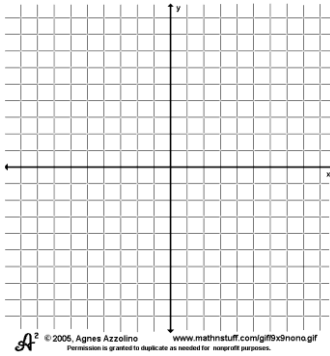
5. Find the x- and y-intercepts of the following equations (write as an ordered pair).

a.  $-x + 2y = 12$

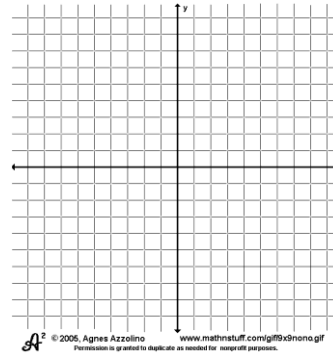
b.  $6y + 3x = -18$

6. Graph each function.

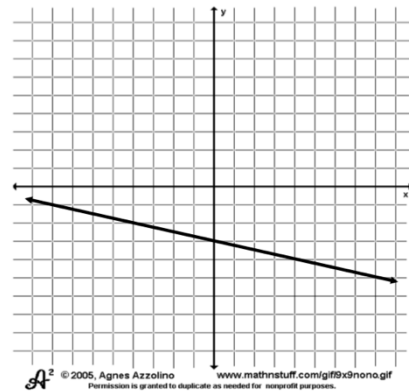
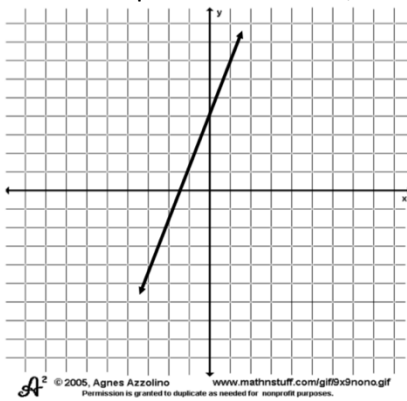
a.  $f(x) = -\frac{2}{3}x - 4$



b.  $f(x) = 4x - 1$



7. Write the equation of the line, in slope intercept form, for each graph.



8. Write an equation for each transformation.

a. Down 9, reflected, compressed by your choice

b. Up 4, stretched by 6

c. Down 2, stretched by your choice, reflected

9. Explain each transformation from the parent function.

a.  $y = -4x + 3$

b.  $y = \frac{6}{5}x - 7$

c.  $y = -\frac{5}{9}x - 9$

d.  $y = \frac{2}{3}x + 6$

### Unit 3 – Linear Functions

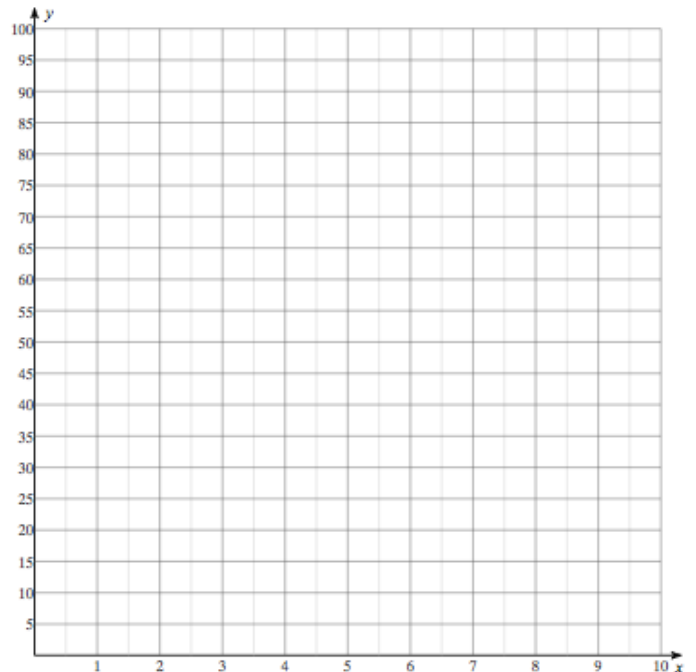
1. Write the equation of the line, in slope intercept form, for each situation.

- Passing thru  $(-2, 5)$  and  $m = 3$
- Passing thru  $(6, 4)$  and  $m = \frac{2}{3}$
- Passing thru  $(1, 2)$  and  $(3, -2)$
- If  $f(4) = -2$  and  $f(8) = 4$
- If  $g(2) = 3$  and  $g(6) = 5$
- Passing thru  $(-1, 3)$  and parallel to  $y = 2x + 2$
- Passing thru  $(18, 2)$  and parallel to  $3y - x = -12$
- Passing thru  $(7, 10)$  and perpendicular to  $y = \frac{1}{2}x - 9$
- Passing thru  $(-3, 3)$  and perpendicular to  $2y = 8x - 6$

2. Draw a scatter plot for the hours studied and the test score.

<b>Hours, x</b>	2	2	3	5	4	1	3	6
<b>Score, y</b>	44	50	60	92	88	35	50	95

- Draw a line of best fit.
- Write the equation of your line of best fit.
- Describe the correlation.
- Estimate the correlation coefficient.



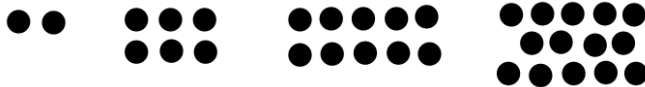
Write a function to represent each table, pattern or sequence.

3.

x	1	2	3	4
f(x)	6	2	-2	-6

4.  $a_1 = -11, d = 3$

5.



Simplify each.

6.  $x^{-9}$

7.  $6x^2y^5 \cdot 5x^4y^7$

8.  $(4xy^4)^2$

9.  $\frac{x^3y^9}{x^5y^2}$