Algebra 2 Unit 1, Day 1– Combining Like Terms Name:_____ Period: Date:

Simplify the following expressions completely.

1.
$$(-3)^2$$

9
2. $(-2)^3$ -8
3. -5^2 -25
4. $(8x-5)+(4x-6)$
12x-11
5. $(6t+1)(t-2)$
6. $(2k+11)-(4-7k)$
7. $(x^2-x+9)-(5x^2+5x-7)$
8. $(3r-5)^2$
6 $t^2-11t-2$
9 $k+7$
4 $x^2-6x+16$
9 $r^2-30r+25$
9. $2a-3(a+5)$
10. $(x-3)^3$
11. $(2a-5)(a^2-4a+1)$
- $a-15$
 $x^3-9x^2+27x-27$
2 $a^3-13a^2-22a-5$

12. If the length of a rectangle can be represented as 2x - 3 and the width is 4x + 5, write an expression that represents the *perimeter* of the rectangle.

12x + 4

13. Write the expression that represents the <u>area</u> of the rectangle above.

$$8x^2 - 2x - 15$$

14. Kurtis is building a walkway that surrounds a rectangular garden. The shaded area in the picture represents this walkway. Write an expression that represents the area of the walkway using the information provided.

$$24x + 36$$

x + 6

Algebra 2	g 1&2 Step Equation	N	lame:
Unit 1, Day 2 – Solving		ns and Inequalities	Period:Date:
Solve the following equation	ions.		
1. $x + 5 = 7$	2. $6 > w - 7$	3. $-11 = b - 9$	4. 187 < -17 <i>r</i>
x = 2	w < 13	<i>b</i> = -2	r < -11
5. $\frac{m}{2} = 14$	6. $\frac{3}{2}k \ge 18$	7. $\frac{8}{5}x = \frac{4}{15}$	8. $3x + 7 \le 19$
m = 28	$k \ge 12$		$x \le 4$
9. 5 <i>h</i> +4>19	10. $7d - 1 < 13$	$x = \frac{1}{6}$ 11. $17 = \frac{w}{5} + 13$	12. $\frac{b}{2} - 9 = 11$
<i>h</i> >3	d < 2	w = 20	b = 40

13.	What is the first step you can take	to solve the equation $6 + \frac{x}{3} = -2$?
	a) Subtract 2 frome each side	b) Add 6 to each side
	c) Divide each side by 3	d) Subtract 6 from each side

14. A skateboarding park charges \$7 per session to skate and \$4 per session to rent safety equipment. Jared rents safety equipment every time he skates. During one year, he spends \$99 for skating charges and equipment rentals. Which equation can be used to find x, the number of sessions Jared attended?

a) 99 = 7x b) 99 = 7x + 4x c) 99 = 7x + 4 d) 99 = 4x + 7

15. A dance academy charges \$24 per class and a one-time registration fee of \$15. A student paid a total of \$687 to the academy. Find the number of classes the student took.

28 classes

B

/)

Algebra 2 Unit 1, Day 3 - Solving Equations

Name:	
Period:	Date:

Solve the following equations.

1. $\frac{1}{2} - y \ge \frac{2}{3}$	2. $5 = 5 - 2x$	3. $1.1 = 3x - 2.5$	4. $\frac{x-2}{-3} = 4$
$y \leq -\frac{1}{6}$	x = 0	<i>x</i> = 1.2	x = -10
5. $7x - 13 - x = 32$		6. $4a - 13 = 7a + 20$	7. $\frac{1}{2}x+4 \le -\frac{2}{3}x+\frac{1}{2}$
$x = \frac{15}{2}$		a = -1	$y \leq -3$
8. $5(2-x) \ge 3-2x+$	7-3x	9. $13 + 6x = 6x + 1$	
All Real N	lumbers	No Solution	
10. $38 = 4(2f - 3) - $	3f	11. $5(3y+2) - 6 > 15y +$	4

f = 10No Solution

13. $z = \frac{x-m}{s}$; solve for x $x = \frac{y-b}{m}$ Solve the following formulas for the variable indicated. **12.** y = mx + b; solve for x x = zs + m

14. The volume of a pyramid is given by the formula $V = \frac{1}{3}b^2h$, where V is the volume of the pyramid, b is the length of one side of the base, and h is the height of the pyramid. Rewrite the equation so that it would give you the height of the pyramid, for a known volume and

base length.

 $h = \frac{3V}{h^2}$

15. You have two summer jobs. In the first job, you work 25 hours per week and earn \$7.75 per hour. In the second job, you earn \$6.25 per hour and can work as many hours as you want. you want to earn \$250 per week. How many hours must you work at the second job? (You must write the equation(a) and solve it(b))

193.75 + 6.25x = 250

9 hours

Algebra 2 – Unit 1 – Day 4 Graph and Write the Equations of Lines

Name:		
Period:	Date:	

Graph the following functions.



7. The line with slope = -3 passing through (5, 1)

y = -3x + 16

9. The line that goes through (6, 1) and (3, 3).

$$y = -\frac{2}{3}x + 5$$

8. A line with m = -2 passing through (0,2)

y = -2x + 2

- **10.** A with an x-intercept of -2, and a y-intercept of 6
 - y = 3x + 6

Algebra 2 – Unit 1 – Day 5 Solve Systems by Graphing and Substitution

Name:	
Period:	Date:

Solve the following systems of equations by graphing.

1.
$$y = x - 1$$
 and $x + y = 3$



Solve the following systems of equations by substitution.

3. y = 4x and x + y = 5 (1, 4)

2. y = 2x and 2x + 5y = -12 *y*Point of Intersection (-1, -2)

4.
$$3x - y = 4$$
 and $2x - 3y = -9$ (3,5)

5.
$$x + 3y = 8$$
 and $2x - 4y = -9$
 $\left(\frac{1}{2}, \frac{5}{2}\right)$
6. $x + 14y = 84$ and $-x - 14y = -7$
No Solution

7.
$$4x - 2y = -60$$
 and $5x - 3y = -78$
(-12,6)
8. $y + 2x = 2$ and $y + x = 1$
(1,0)

Algebra 2 – Unit 1 – Day 6 Solve Systems by Elimination

Name:		
Period:	Date:	

Solve the following systems of equations by elimination.

1.
$$-x + 2y = 12$$
 and $x + 6y = 20$
 $(-4, 4)$
2. $2x + 5y = 14$ and $4x + 5y = 8$
 $(-3, 4)$
3. $x + y = 1$ and $x - 2y = 2$
 $\left(\frac{4}{3}, -\frac{1}{3}\right)$
4. $2x + 5y = 3$ and $-x + 3y = -7$
 $(4, -1)$

5.
$$y = -2x + 8$$
 and $y = -3x + 13(5, -2)$

6. 2x - y = 6 and -2x + y = 15No Solution

7.
$$-2x + 7y = -2$$
 and $2x - 7y = 2$
Infinately Many Solutions

8.
$$y = 9x - 35$$
 and $5x + 8y = 28$ (4,1)

9.
$$-5x + 8y = 29$$
 and $7x + 3y = 2$

(-1,3)

10. 9x + 8y = 7 and 18x - 15y = 14 $\left(\frac{7}{9}, 0\right)$ Algebra 2Name:Unit 1 Day 7 Worksheet – Absolute ValuesPeriod:Solve the following problems and check for extraneous solutions1. |3x - 2| = 232. |x - 3| = 103. -|3x - 4| - 12 = 10x=25/3 and -7x=13 and -74. 3|4x - 3| + 12 = 275. |2x + 5| = 3x

x=2 and -1/2

x=5

Graph the following absolute value functions



Algebra 2 – Unit 1 – Day 8 Domain and Range

Name:		
Period:	Date:	

Given the following information, find the domain and range for the following.





10. Eric wants to buy T-shirts for homecoming. It costs \$20 for a design fee, and each T-shirt is \$5. Eric knows that the amount of money it costs to produce the homecoming T-shirts is dependent on the number of T-shirts he orders. Write a function for Eric, and then state the domain and range of that function.

C(t) = 5t + 20

 $D: \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10....\}$ $R: \{0, 25, 30, 35, 40, 45, 50....\}$

Name:		
Period:	Date:	

Given the following graph, write the domain and range in inequality, set, and interval notation. Also, describe using words.

1.				
	Words	Inequality	Set	Interval
D	All numbers between -6 inclusive and 9 exclusive	-6 ≤ x < 9	$\{x \mid -6 \le x \le 9\}$	[-6, 9)
R	All numbers between -4 inclusive and 1 exclusive	-4 ≤ y < 1	$\{y \mid -4 \le y \le 1\}$	[-4, 1)



		Inequality	Set	Interval
2.	D	<i>x</i> < 2	$\{x x<2\}$	(−∞, 2)
	R	<i>y</i> < 8	$\{y y<8\}$	(−∞, 8)



3.

	Inequality	Set	Interval
D	$-\infty < x < \infty$	$\{x -\infty < x < \infty\}$	(−∞,∞)
R	$y \ge 1$	$\{y y \ge 1$	[1 , ∞, 8)





5. Given the graph of f(x) below, which of the following statements are true? Select <u>all</u> that apply.

- **A.** The rate of change over the interval $(0, \infty)$ is $-\frac{1}{2}$. **B.** The domain is $(-\infty, \infty)$. **C.** The domain is $(-\infty, 0]$.
- **D.** The range is $(-\infty, \infty)$.
- **E.** The range is $(-\infty, 0]$.
- **F.** The function $f(x) = -\frac{1}{2}|x|$ represents the graph.



6. The table below shows the fees for renting a boat at the lake. What is the domain and range of the function?

Hours, x	$0 < x \leq 2$	$2 < x \leq 4$	$4 < x \leq 8$	$8 < x \le 10$
Cost, y	\$350	\$500	\$800	\$1000

- A. D: $\{x | 0 < x \le 10\}$ R: $\{y|350 \le y \le 1000\}$
- **B.** $D: \{x | 0 < x \le 10\}$ R: {350, 500, 800, 1000}
- **C.** D: {0, 2, 4, 8, 10} R: { $y|350 \le y \le 1000$ }
- **D.** D: {0, 2, 4, 8, 10} R: {350, 500, 800, 1000}

 Name:

 Period:

 Date:
 Graph Piecewise Functions – Restricted Domains Evaluate the piecewise functions given the following domains. $h(x) = \begin{cases} x+5, & \text{if } x \le -1 \\ -3x+1, & \text{if } x > -1 \end{cases}$ **2**) for h(-3)**3**) when x = -11) when x = 1h(-3) = 2h(1) = -2h(-1) = 4 $g(x) = \begin{cases} \frac{1}{2}x + \frac{3}{4}, & \text{if } x < -1 \\ x^2 - 1, & \text{if } -1 \le x < 4 \\ \sqrt{3x + 4}, & \text{if } x \ge 4 \end{cases}$ $g(\pi) = \pi^2 - 1 \approx 8.87$ when x = 4 g(4) = 4 **5**) when $x = -\frac{5}{2}$ $g\left(-\frac{5}{2}\right) = -\frac{1}{2}$ **6**) g(-1) **7**) $g(\pi)$ **4**) g(-1)=0



V

Algebra 2 – Unit 1 – Day 10



9) $f(x) = \{-x+3, if x > 0\}$



Use the graph to evaluate the function at x = 4 ______

10) $f(x) = \{4, if x \le -1\}$

11) $g(x) = \{2 - x, if x > 1\}$





Evaluate the function at x = 0 <u>No Solution</u>

Algebra 2 – Unit 1 – Day 11 Graph Piecewise Functions Part 2 Name:_____ Period:_____Date:____

Graph the following piecewise functions. Then evaluate the function to find the given value.



4)
$$f(x) = \begin{cases} x+4, & \text{if } x < -1 \\ 3, & \text{if } -1 \le x \le 2 \\ -\frac{1}{2}x+4, & \text{if } x > 2 \end{cases}$$

Evaluate the function at x = -4 0





6. Which piecewise function is represented by the graph?

A.
$$f(x) = \begin{cases} 3x + 2, & x < 1 \\ x - 1, & x > 1 \end{cases}$$

B.
$$f(x) = \begin{cases} 3x + 2, & x \le 1 \\ x - 1, & x > 1 \end{cases}$$

C.
$$f(x) = \begin{cases} 3x + 2, & x \ge 1 \\ x - 1, & x > 1 \end{cases}$$

D.
$$f(x) = \begin{cases} x - 1, & x < 1 \\ 3x + 2, & x \ge 1 \end{cases}$$



7. Which of the following piecewise functions represents the graph below?

A.
$$f(x) = \begin{cases} \frac{3}{2}x+1, & x < -2\\ 2x+3, & -2 \le x < 1\\ -x+2, & x \ge 1 \end{cases}$$

B.
$$f(x) = \begin{cases} -\frac{3}{2}x+1, & x < -2\\ 2x+3, & -2 \le x < 1\\ x+2, & x \ge 1 \end{cases}$$

C.
$$f(x) = \begin{cases} -\frac{3}{2}x+1, & x \le -2\\ 2x+3, & -2 < x \le 1\\ x+2, & x > 1 \end{cases}$$

D.
$$f(x) = \begin{cases} \frac{3}{2}x+1, & x \le -2\\ 2x+3, & -2 < x \le 1\\ x+2, & x > 1 \end{cases}$$

