# Algebra 2 Level 2
# Summer Packet

- This packet is designed to help you retain the information you learned in Algebra 1 and realize what skills are essential for you as you enter Algebra 2.
- This packet will be due Friday September 5th, 2014.
- **Please show all your work on the packet. If no work is shown, no credit will be given! Please place all answers on the answer sheet.**
- Here are some online resources you can use to help you if you are having trouble. There are also many others you can find using a google search. There is also a cheat sheet with formulas attached.

1. **Khan Academy**
2. **Purple Math**
3. **Google Math Tools**

In preparation for this class, we recommend you arrive on the first day of class with the following supplies:

- 1 ½" or 2" 3 ring binder
- Loose leaf paper or notebook
- Dividers for your binder
- Handheld pencil sharpener
- Scientific calculator
- A graphing calculator is only recommended for students who plan on entering a math/science field in college.
- Pencils

# Cheat Sheet

## Linear Equations

Slope Formula: $m = \frac{y_2 - y_1}{x_2 - x_1}$

Slope Intercept Form: $y = mx + b$

Point Slope Form: $y - y_1 = m\,(x - x_1)$

Standard Form: $Ax + By = C$

## Writing the Equation of a Line Given Two Points

$(-6, 7)$ & $(-9, 8)$

Identify the slope: $m = \frac{y_2 - y_1}{x_2 - x_1}$

$$m = \frac{8-7}{-9+6}$$

$$m = -\frac{1}{3}$$

Plug into point slope form:

$$y - y_1 = m\,(x - x_1)$$

$$y - 7 = -\frac{1}{3}(x + 6)$$

$$y - 7 = -\frac{1}{3}x - 2$$

$$y = -\frac{1}{3}x + 5$$

## Solving Absolute Value Equations

**Example** Solve $|2x - 3| = 17$. Check your solutions.

$$2x - 3 = 17 \qquad 2x - 3 = -17$$
$$2x - 3 + 3 = 17 + 3 \qquad 2x - 3 + 3 = -17 + 3$$
$$2x = 20 \qquad 2x = -14$$
$$x = 10 \qquad x = -7$$

CHECK $|2x - 3| = 17$

$|2(10) - 3| \stackrel{?}{=} 17$

$|20 - 3| \stackrel{?}{=} 17$

$|17| \stackrel{?}{=} 17$

$17 = 17$ ✓

CHECK $|2x - 3| = 17$

$|2(-7) - 3| \stackrel{?}{=} 17$

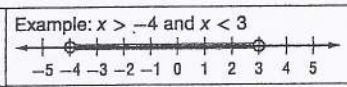
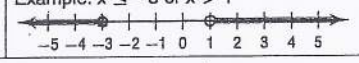
$|-14 - 3| \stackrel{?}{=} 17$

$|-17| \stackrel{?}{=} 17$

$17 = 17$ ✓

There are two solutions, 10 and $-7$.

## Solving Compound Inequalities

| | | |
|---|---|---|
| *And* Compound Inequalities | The graph is the intersection of solution sets of two inequalities. | Example: $x > -4$ and $x < 3$   |
| *Or* Compound Inequalities | The graph is the union of solution sets of two inequalities. | Example: $x \le -3$ or $x > 1$   |

**Example 1** Solve $-3 \le 2x + 5 \le 19$. Graph the solution set on a number line.

$-3 \le 2x + 5$ and $2x + 5 \le 19$

$-8 \le 2x \qquad 2x \le 14$

$-4 \le x \qquad x \le 7$

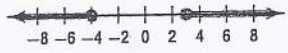
$-4 \le x \le 7$


**Example 2** Solve $3y - 2 \ge 7$ or $2y - 1 \le -9$. Graph the solution set on a number line.

$3y - 2 \ge 7$ or $2y - 1 \le -9$

$3y \ge 9$ or $2y \le -8$

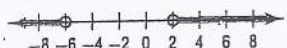
$y \ge 3$ or $y \le -4$




## Solving Absolute Value Inequalities

**Example 1** Solve $|x + 2| > 4$. Graph the solution set on a number line.

By statement 2 above, if $|x + 2| > 4$, then $x + 2 > 4$ or $x + 2 < -4$. Subtracting 2 from both sides of each inequality gives $x > 2$ or $x < -6$.




**Example 2** Solve $|2x - 1| < 5$. Graph the solution set on a number line.

By statement 1 above, if $|2x - 1| < 5$, then $-5 < 2x - 1 < 5$. Adding 1 to all three parts of the inequality gives $-4 < 2x < 6$. Dividing by 2 gives $-2 < x < 3$.

Name:

Algebra 2 Level 2 Summer Packet Answer Sheet

1.

2.

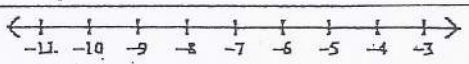
3.

4.

5.

6.

7.

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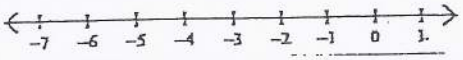


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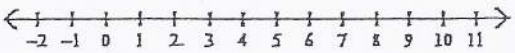


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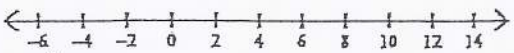


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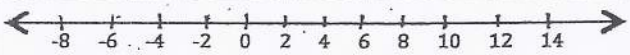


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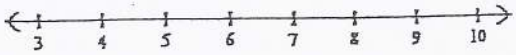


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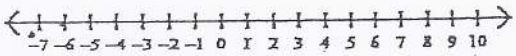


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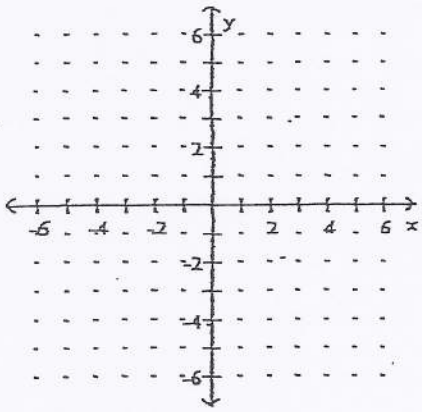


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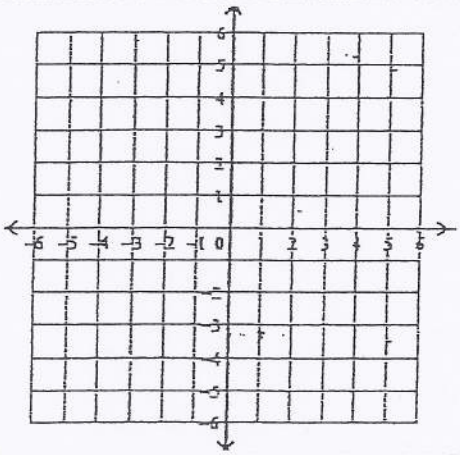

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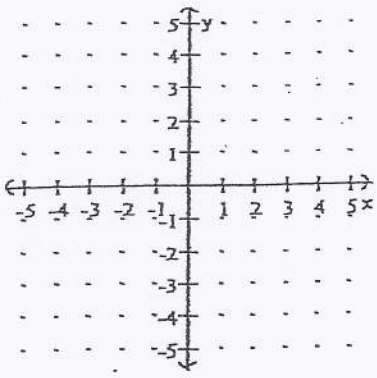


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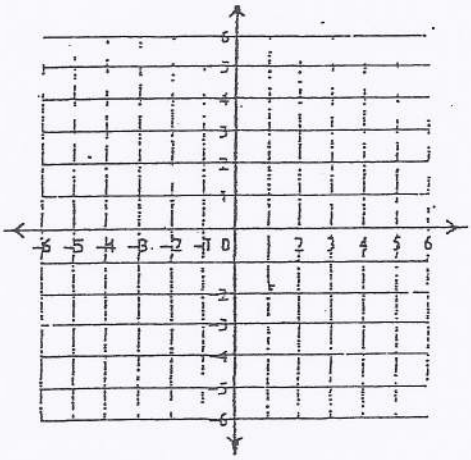


20.

21. x-intercept

y-intercept

slope

22. slope

y-intercept

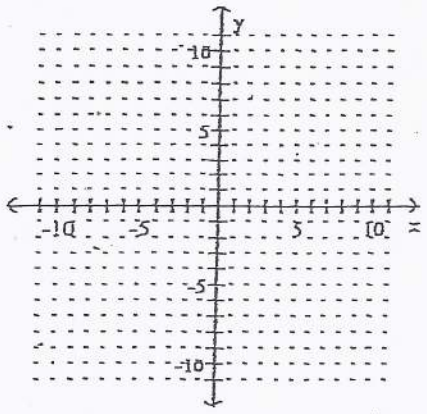
23.

24.

25.

26.

27.




28.

29.

30.

31.

32a.

32b.

32c.

32d.

Name:_____ Date:_____

**Algebra 2 Level Summer Packet: This packet is for all students entering Algebra 2 (2)**

**All work must be shown for credit. The packet is due on Friday September 5, 2014 All answers should be placed on the answer sheet. All work should be placed on the space provided.**

1. Simplify using the order of operations.

   $10 \div 5 \bullet 5^2 - 15 \bullet 2 - 3$

2. Solve the proportion.

   $$\frac{3v+8}{10} = \frac{v+6}{9}$$

**Solve each equation.**

3. $4(2n+3) = -(n-8) + 7n$

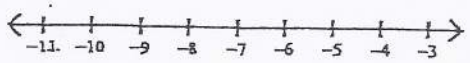
4. $4(x+6) - (4x+24) = 0$

5. $\frac{2}{5}n + \frac{1}{2} = n - \frac{1}{2}$

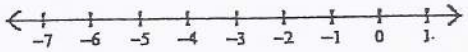
6. $-4 + 5(-7-n) = 3n - 4(-3+2n)$

Solve each inequality and graph its solution.

7. $12 + 6k \leq 5(1 + k)$

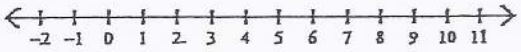



8. $-7(2b + 5) + 6 > -6b + 5(b + 2)$

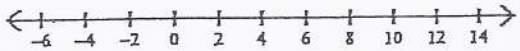



Solve each compound inequality and graph its solution.

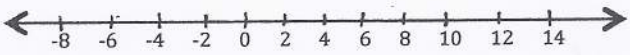
9. $6 + 6k > 0$ and $5k - 8 \leq 37$




10. $1 - 2n < -8 - n$ or $9n - 1 < 2n - 8$




11. $8b + 9 < 7b + 3 < 8b - 10$



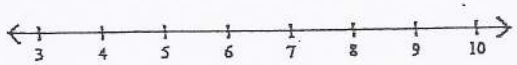

Solve each equation.

12. $|b + 1| = 9$

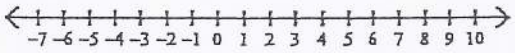
13. $4|2y - 7| + 5 = 9$

Solve each absolute value inequality and graph its solution:

14. $|x-6| \leq 1$

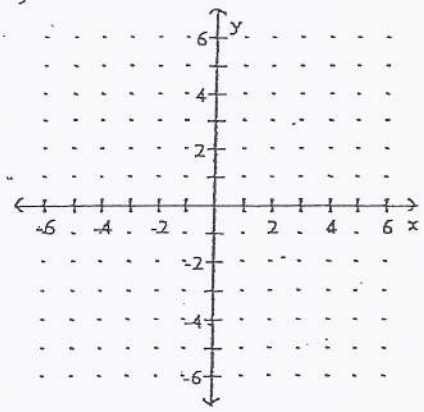



15. $|10-5n|+1>26$

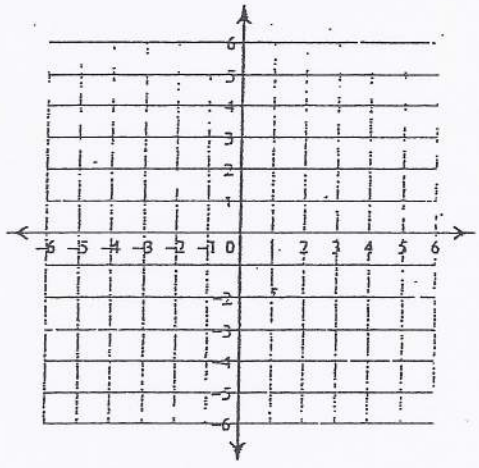



Graph each linear equation.

16. $y=-6x+4$

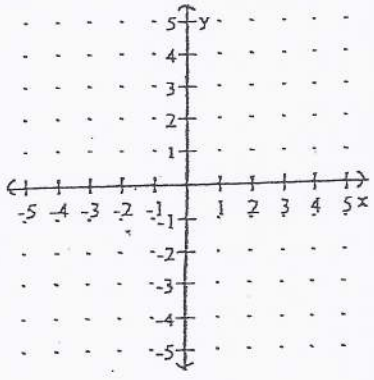



17. $3x-5y=-10$

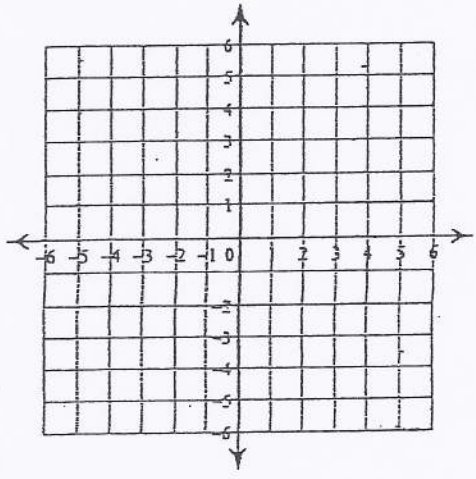


18. Graph the linear equation.

$y+3=0$



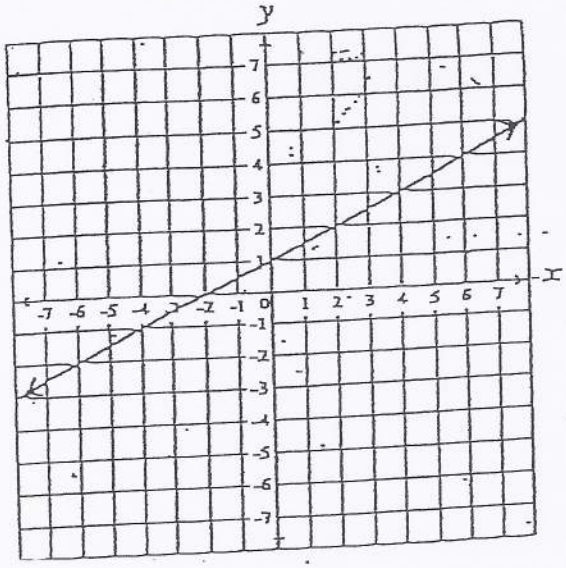

19. $x=-3$



Find the slope of the line that goes through the given points.

20. (3, −8), (−7, −3)

21.




What is the apparent x-intercept ?

What is the apparent y-intercept?

What is the slope of the line?

22. $3x + 5y = 22$

a) Find the slope of the line.

b) Find the y-intercept.

Use the slope-intercept form of the linear equation to write the equation of the line with the given slope and y-intercept.

23. Slope $-\frac{4}{5}$; y-intercept 8

**Write the slope-intercept form of the equation of the line through the given point with the given slope.**

24. through: $(2, -5)$, slope $= -\frac{1}{2}$.

**Write the slope-intercept form of the equation of the line through the given points.**

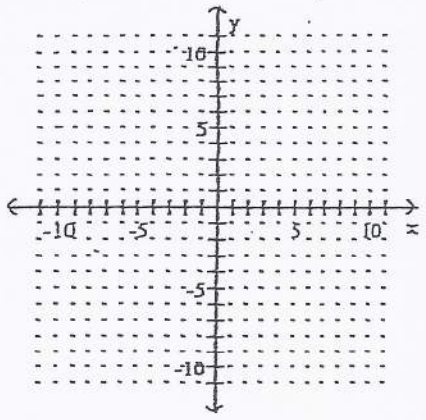
25. through: $(-3, -3)$ and $(3, 1)$

**Write the slope-intercept form of the equation of the line described.**

26. through: $(3, -1)$, parallel to $y = \frac{1}{3}x + 1$

27. Graph the linear inequality.

$3x + 5y \geq -15$

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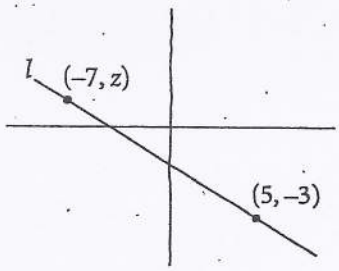



In the figure above, the slope of line $l$ is $-\frac{5}{12}$. What is the value of $z$?

(A) $\frac{1}{4}$

(B) $\frac{1}{2}$

(C) 1

(D) 2

(E) 4

29. If $x - y = 8$, $y = 3z$, and $z = 2$, what is the value of $x$?

(A) −14
(B) −2
(C) 2
(D) 3
(E) 14

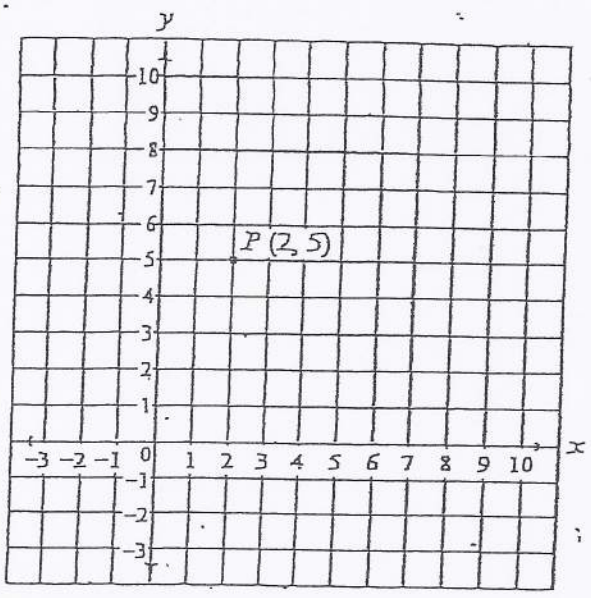
30. If you add some number $j$ to 50, and then divide this sum by $j$, the result is 3. What is the value of $j$?

(A) 5
(B) 10
(C) 15
(D) 20
(E) 25

Given the function, find the indicated value.

31. Find $f(-2)$ when $f(x) = 2x^2 + 4x + 4$.

32. Anthony plotted the point $P(2, 5)$ on a coordinate grid, as shown below.




Anthony then graphed line $q$ on the same coordinate grid.

- Line $q$ contains point $P$.
- The $y$-intercept of line $q$ is the point with coordinates $(0, 4)$.

a. What is the slope of line $q$? Show or explain how you got your answer.

b. Write an equation of line $q$. Show or explain how you got your equation.

Anthony also graphed line $n$ on the same coordinate grid. Line $n$ contains point $P$ and is perpendicular to line $q$.

c. What is the slope of line $n$? Show or explain how you got your answer.

d. Write an equation of line $n$. Show or explain how you got your equation.