

Name \_\_\_\_\_

## SUMMER MATH PACKET 3B

### FOR STUDENTS ENTERING ALGEBRA II

The problems in this packet have been selected to help you to review concepts in preparation for your next math class.

Please complete the **odd problems** in this packet.

- Show all your work.
- The work should be done in the booklet itself.
- No calculator for this problem set!
- Give the complete packet to your teacher on the first day of school.
- This will be counted as a graded assignment.

Have a great summer and we look forward to seeing you in September.

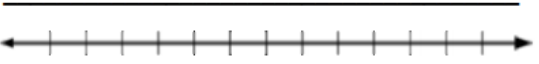
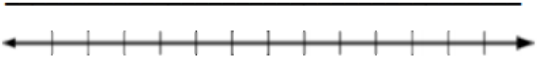
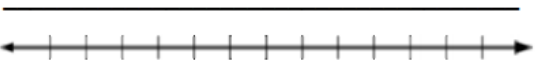
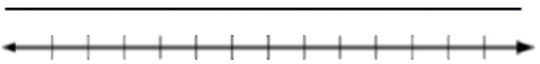
*Randy Bernstein*

*Math Chair*

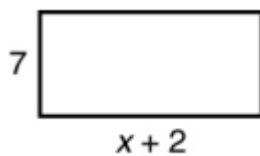
*Ma'ayanot Yeshiva High School for Girls*

Name \_\_\_\_\_

Solve each inequality and graph the solutions.

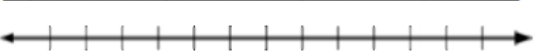
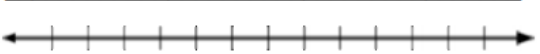
<p>1) <math>2(3n + 7) &gt; 5n</math></p> 	<p>2) <math>5x - 9 &lt; 2(x - 6)</math></p> 
<p>3) <math>-3(3x + 5) \geq -5(2x - 2)</math></p> 	<p>4) <math>1.4x + 2.2 \geq 2.6x - 0.2</math></p> 

5) For what values of  $x$  is the area of the rectangle below greater than its perimeter?



Name \_\_\_\_\_

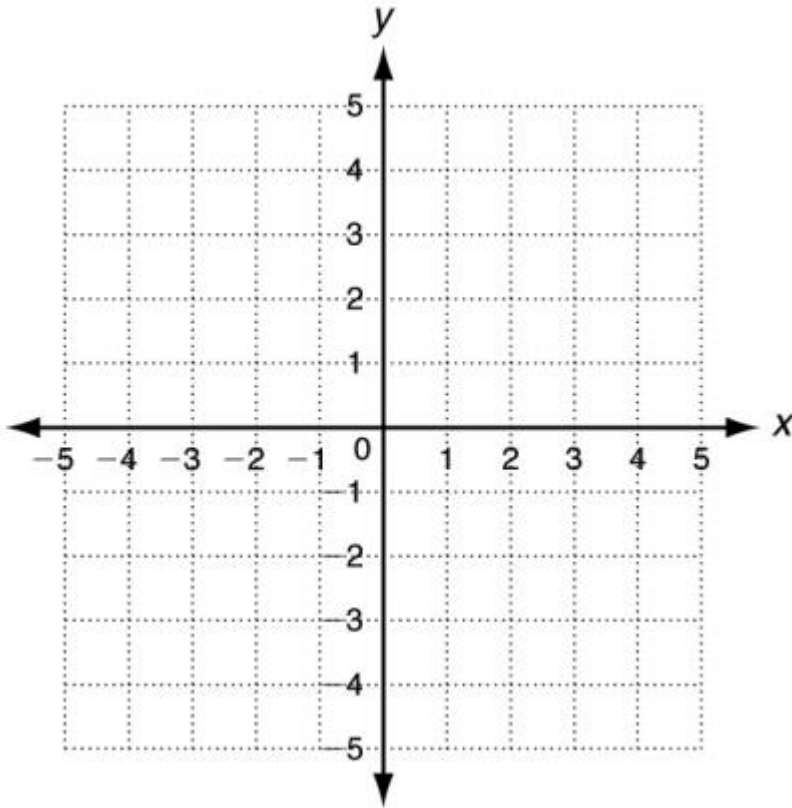
Solve each compound inequality and graph the solutions.

<p>6) <math>-15 &lt; x - 8 &lt; -4</math></p>  <p>A horizontal number line with arrows at both ends. There are 15 tick marks along the line, but no numerical labels are provided.</p>	<p>7) <math>12 \leq 4n &lt; 28</math></p>  <p>A horizontal number line with arrows at both ends. There are 15 tick marks along the line, but no numerical labels are provided.</p>
---	--

Name \_\_\_\_\_

**Systems of equations:**

8) Solve the system of equations  $\begin{cases} 4x + y = -1 \\ y - 4 = x \end{cases}$  by graphing.



Name \_\_\_\_\_

9) Solve the system of equations  $\begin{cases} 3x - 2 = y \\ y - 2x = -5 \end{cases}$  by substitution.

10) Solve the system of equations  $\begin{cases} 3x - 2y = 4 \\ x + 4y = 34 \end{cases}$  by elimination.

Name \_\_\_\_\_

**Simplify the following Expressions.**

11) $8x - 9y + 16x + 12y$	12) $14y + 22 - 15y^2 + 23y$
13) $5n - (3 - 4n)$	14) $-2(11x - 3)$
15) $10y(16x + 11)$	16) $-(5x - 6)$
17) $3(18x - 4y) + 2(10x - 6y)$	18) $(8c + 3) + 12(4c - 10)$
19) $9(6x - 2) - 3(9x^2 - 3)$	20) $-(y - x) + 6(5x + 7)$

Name \_\_\_\_\_

**Solve each equation. You must show all your work.**

21) $8(3x - 4) = 196$	22) $45x - 720 + 15x = 60$
23) $132 = 4(12x - 9)$	24) $198 = 154 + 7x - 68$
25) $-131 = -5(3x - 8) + 6x$	26) $-7x - 10 = 18 + 3x$
27) $12x + 8 - 15 = -2(3x - 82)$	28) $-(12x - 6) = 12x + 6$

Name \_\_\_\_\_

**Solving Literal Equations:**

- A literal equation is an equation that contains more than one variable.
- You can solve a literal equation for one of the variables by getting that variable by itself. (Isolating the specified variable.)

*Ex. 1:  $3xy = 18$ , Solve for  $x$ .*

$$\frac{3xy}{3y} = \frac{18}{3y}$$
$$x = \frac{6}{y}$$

*Ex. 2:  $5a - 10b = 20$ , Solve for  $a$ .*

$$+10b = +10b$$
$$5a = 20 + 10b$$
$$\frac{5a}{5} = \frac{20}{5} + \frac{10b}{5}$$
$$a = 4 + 2b$$

**Solve each equation for the specified variable.**

29) $Y + V = W$ , for $V$	30) $9wr = 81$ , for $w$
31) $2d - 3f = 9$ , for $f$	32) $dx + t = 10$ , for $x$
33) $P = (g - 9)180$ , for $g$	34) $4x + y - 5h = 10y + u$ , for $x$



Name \_\_\_\_\_

**Exponents:**

**Simplify each expression.**

35) $(c^3)(c)(c^2)$	36) $\frac{m^{15}}{m^3}$	37) $(k^4)^5$
38) $d^0$	39) $(p^4q^2)(p^7q^5)$	40) $\frac{45y^3z^{10}}{5y^3z}$
41) $(-t^7)^3$	42) $3f^3g^0$	43) $(4h^5k^3)(15k^2h^3)$
44) $\frac{12a^4b^6}{36ab^2c}$	45) $(3m^2n)^4$	46) $(12x^2y)^0$
47) $(-5a^2b)(2ab^2c)(-3b)$	48) $4x(2x^3y)^0$	49) $(3x^4y)(2y^2)^3$

Name \_\_\_\_\_

**Multiply. Write your answer in simplest form.**

50) $(x + 10)(x - 9)$	51) $(x - 10)(x - 2)$	52) $(x - 8)(x + 81)$
53) $(2x - 1)(4x + 3)$	54) $(-2x + 10)(-9x + 5)$	55) $(-3x - 4)(2x + 4)$
56) $(x + 10)^2$	57) $(-x + 5)^2$	58) $(2x - 3)^2$

Name \_\_\_\_\_

**Factor the following expressions completely.**

59) $x^2 - 5x$	60) $6x^2 + 3x$	61) $3x^2 - 36x$
62) $-5x^7 - 50x^4$	63) $20x^5 - 8x^4 - 4x^3$	64) $36x^4 + 24x^2$
65) $(x^2 - 36)$	66) $(x^2 - 81)$	67) $(x^2 - 49)$
68) $(9x^2 - 100)$	69) $(x^2 - 121)$	70) $(81x^2 - 4)$

**Factor the following trinomials completely.**

71) $x^2 + 11x + 10$	72) $x^2 - 14x + 24$	73) $x^2 - 10x - 56$
74) $x^2 + 7x + 12$	75) $x^2 + 12x + 27$	76) $x^2 + 2x + 1$
77) $x^2 - 11x + 18$	78) $x^2 + 8x - 9$	79) $x^2 - 9x + 14$

Name \_\_\_\_\_

**Factor the following trinomials completely.**

80) $3p^2 - 2p - 5$	81) $2n^2 + 3n - 9$	82) $3n^2 - 8n + 4$
83) $5n^2 + 19n + 12$	84) $2v^2 + 11v + 5$	85) $2n^2 + 5n + 2$

**The following equations are factored for you. Solve each equation.**

86) $(k + 1)(k - 5) = 0$	87) $(a + 1)(a + 2) = 0$
88) $(4k + 5)(k + 1) = 0$	89) $(2m + 3)(4m + 3) = 0$

Name \_\_\_\_\_

Set each of the following equations to zero, factor, and solve for  $x$ .

90) $x^2 - 11x + 19 = -5$	91) $n^2 + 7n + 15 = 5$
92) $n^2 - 10n + 22 = -2$	93) $n^2 + 3n - 12 = 6$
94) $6n^2 - 18n - 18 = 6$	95) $7r^2 - 14r = -7$

Name \_\_\_\_\_

96) $n^2 + 8n = -15$	97) $5r^2 - 44r + 120 = -30 + 11r$
98) $-4k^2 - 8k - 3 = -3 - 5k^2$	99) $b^2 + 5b - 35 = 3b$
100) $3r^2 - 16r - 7 = 5$	101) $6b^2 - 13b + 3 = -3$

Name \_\_\_\_\_

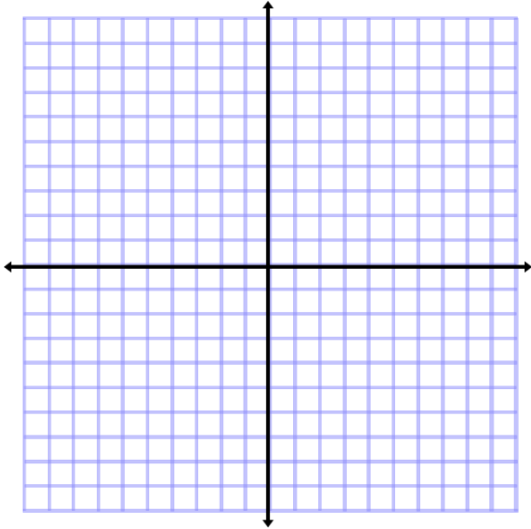
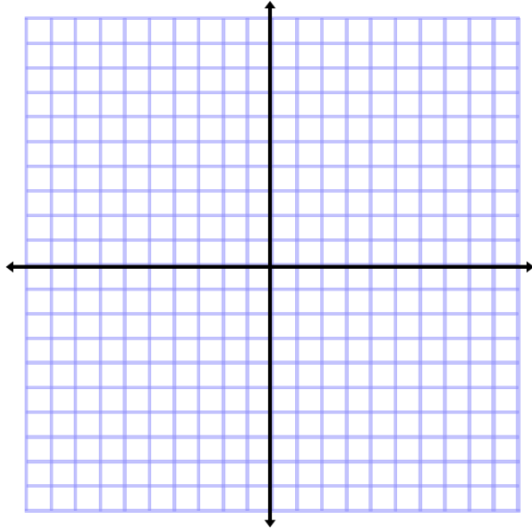
102) $7k^2 - 6k + 3 = 3$	103) $35k^2 - 22k + 7 = 4$
104) $7x^2 + 2x = 0$	105) $10b^2 = 27b - 18$
106) $8x^2 + 21 = -59x$	107) $15a^2 - 3a = 3 - 7a$

Name \_\_\_\_\_

Express each of the following radicals in simplest radical form.

108) $\sqrt{90}$	109) $\sqrt{175}$	110) $\sqrt{288}$
111) $\sqrt{486}$	112) $2\sqrt{16}$	113) $6\sqrt{500}$

Use the slope and intercept to graph the following lines.

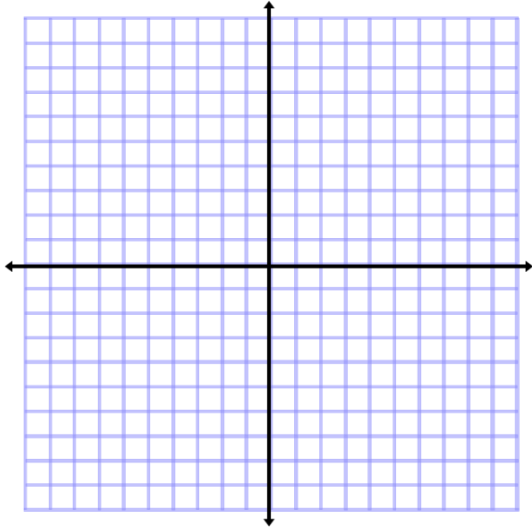
114) $y = 2x + 5$ Slope: _____ Intercept: _____ 	115) $y = -3x$ Slope: _____ Intercept: _____ 
---	---



Name \_\_\_\_\_

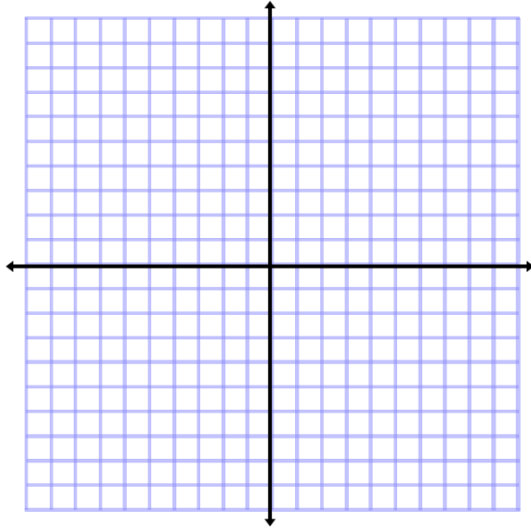
116)  $y = -\frac{2}{5}x + 4$

Slope: \_\_\_\_\_ Intercept: \_\_\_\_\_



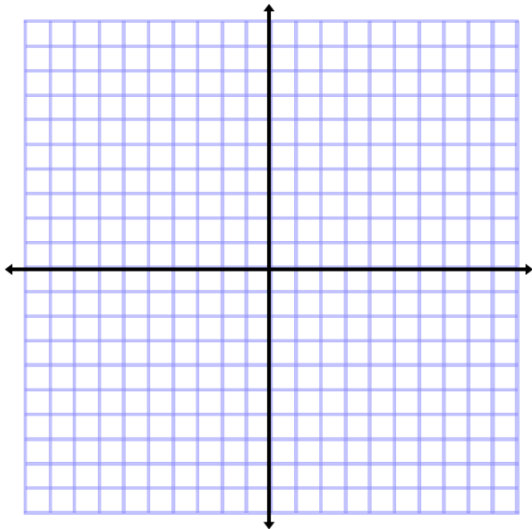
117)  $y = \frac{1}{2}x - 3$

Slope: \_\_\_\_\_ Intercept: \_\_\_\_\_



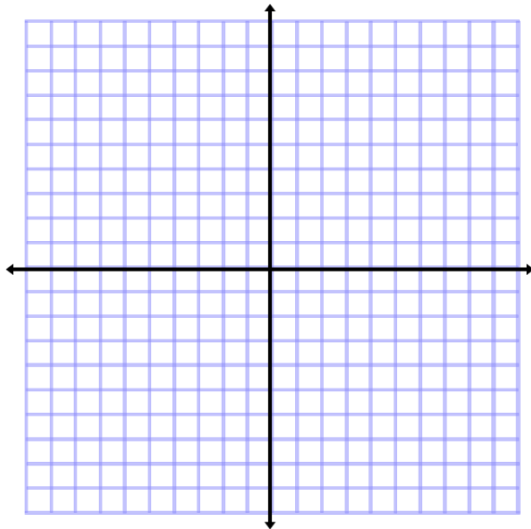
118)  $y = -x + 2$

Slope: \_\_\_\_\_ Intercept: \_\_\_\_\_



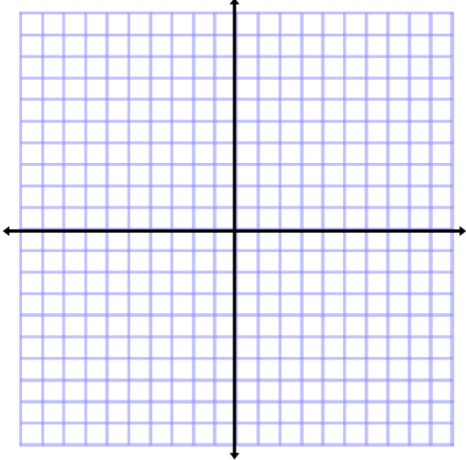
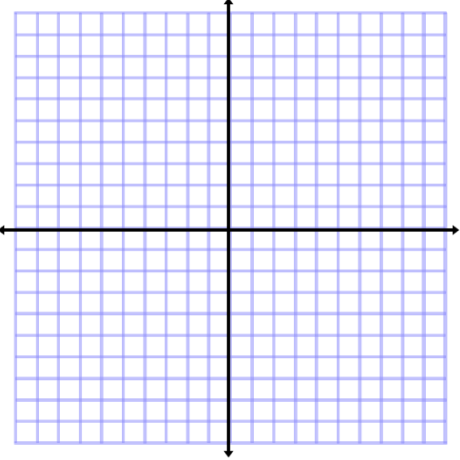
119)  $y = x$

Slope: \_\_\_\_\_ Intercept: \_\_\_\_\_



Name \_\_\_\_\_

The following equations are in standard form. Rewrite them in slope intercept form, identify the  $y$ -intercept and slope, and then graph them.

<p>120) <math>5x + 2y = 10</math></p> <p>Slope: _____ Intercept: _____</p> 	<p>121) <math>4x - 3y = 9</math></p> <p>Slope: _____ Intercept: _____</p> 
---	---

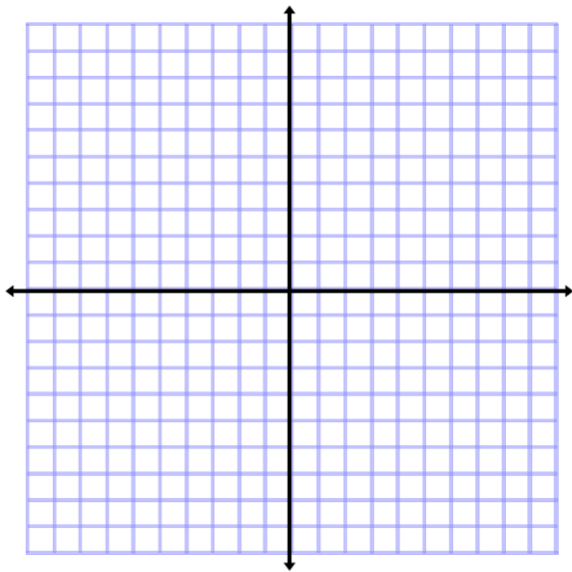
Name \_\_\_\_\_

The following equations are in standard form. Solve for the  $x$ -intercept and  $y$ -intercept. Then graph the lines by plotting these points on the appropriate axes and connecting them.

122)  $3x + y = 3$

To find the  $x$ -intercept, let  $y = 0$  and solve for  $x$ .

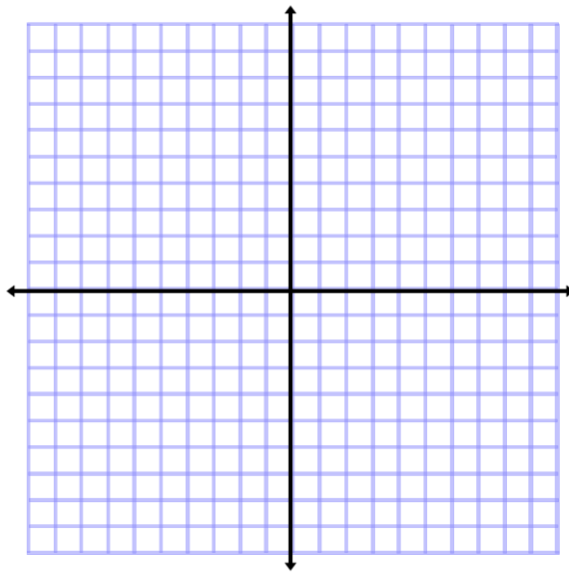
To find the  $y$ -intercept, let  $x = 0$  and solve for  $y$ .



123)  $-2x + 6y = 12$

To find the  $x$ -intercept, let  $y = 0$  and solve for  $x$ .

To find the  $y$ -intercept, let  $x = 0$  and solve for  $y$ .



124) Find the  $x$ -intercept of the equation  $x + 5y = 20$ .

125) Find the  $x$ - and  $y$ -intercepts of  $3x - y = 6$ .

Name \_\_\_\_\_

126) Find the slope of the line that contains the points  $(6, 8)$  and  $(2, 1)$ .

127) Find the slope of the line that contains the points  $(4, 5)$  and  $(7, 11)$ .

128) Find the distance between the points  $A(6, 7)$  and  $B(2, 4)$ .

129) Find the distance between the points  $A(5, 6)$  and  $B(1, 3)$ .

130) Find the coordinates of the midpoint of  $\overline{AB}$  with endpoints  $A(2, -6)$  and  $B(-6, 2)$ .

Name \_\_\_\_\_

- 131) Write an equation in point-slope form that describes the line with a slope of  $-3$  that contains the point  $(1, 2)$ .
- 132) Write an equation in slope-intercept form for the line that passes through  $(0, -1)$  and is perpendicular to the line described by  $y = \frac{1}{8}x + 4$ .
- 133) Write an equation in slope-intercept form for the line that passes through  $(-3, 2)$  and is perpendicular to the line described by  $y = \frac{3}{2}x + 4$ .
- 134) Write an equation in slope-intercept form for the line that passes through  $(24, 5)$  and is parallel to the line described by  $y = \frac{1}{8}x + 4$ .
- 135) Write an equation in slope-intercept form for the line that passes through  $(-4, -6)$  and is parallel to the line described by  $y = \frac{3}{2}x + 4$ .