Notre Dame High School

220 Jefferson Street

Fairfield, CT 06825

June 2015

Dear Parent(s)/Guardian(s) and Incoming Honors and High Honors Algebra II/Trig Students,

Mathematics is the gateway to all college and career opportunities. As stated by the National Research Council:

"Students today are growing up in a world permeated by mathematics. The technologies used in homes, schools, and the workplace are all built on mathematical knowledge. Many educational opportunities and good jobs require high levels of mathematical expertise."

In an effort to build a strong foundation for high school math skills and to improve student success in Algebra II/Trig Students are required to complete the enclosed Summer2015 Math packet. The problems in this packet will review key math skills from previous math courses, and will better prepare students for the new concepts of Algebra II/Trig.

Summer Packet Guidelines:

No calculators are to be used to solve problems.

- All work must be done in pencil and shown under each problem.
- Summer packets for High Honors and Honors Algebra II/Trig are due Wednesday, September 2, 2015.
- After reviewing packets, the teachers of these classes will know which preliminary skills need to be reviewed with the students.
- The teachers of the Mathematics Department are available after school for extra help. I encourage all students to take advantage of working with their own teacher so the teacher can fully assess their knowledge of mathematics.

Please feel free to email me with any concerns or questions over the summer. I will be doing day trips during the summer but will get back to you within a few days of your email. You may reach me at szembrzuski@notredame.org . In the subject area indicate Algebra II/Trig.

Sherrie Zembrzuski

Math Department Chairperson

SUMMER MATH PACKET

NOTRE DAME HIGH SCHOOL

ALGEBRA II/TRIG

HH/H

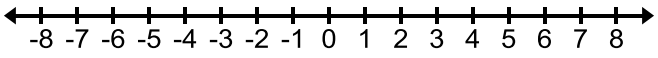
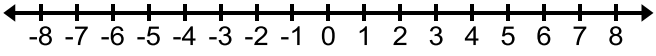
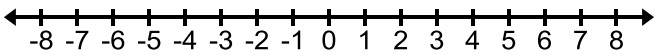
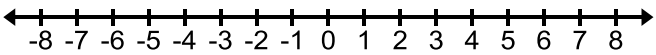
The examples on the following pages are to be completed and handed into your teacher on Wednesday, September 2, 2015. This will aid the teachers of these classes to give focus to mathematical concepts that will be necessary for this class.

Name_____

SOLVE EACH OF THE FOLLOWING. SHOW ALL WORK. IF YOU DO NOT SHOW THE WORK YOU WILL NOT RECEIVE THE CREDIT.

1). $x - 48 = 110$	2). $29 = a + 5$
3). $\frac{1}{2}t = -8$	4). $\frac{1}{3}z - 8 = -4$
5). $32 = 12 + 4(z - 1)$	6). $5(x + 2) - 7 = 5x + 3$

SOLVE EACH OF THE FOLLOWING. GRAPH THE SOLUTIONS ON THE NUMBER LINE PROVIDED. SHOW ALL WORK.

7). $-3(x - 1) > -3x - 2$ 	8). $2 + \frac{1}{3}y > \frac{2}{3}$ 
9). $-8 \leq c - 3 < -1$ 	10). $a - 6 < -4$ or $a - 1 > 5$ 

11). **GIVE THE DOMAIN AND RANGE FOR EACH RELATION. TELL WHETHER THE RELATION IS A FUNCTION OR NOT.**

{(3,4), (-1,2), (2, -3), (5,0)}

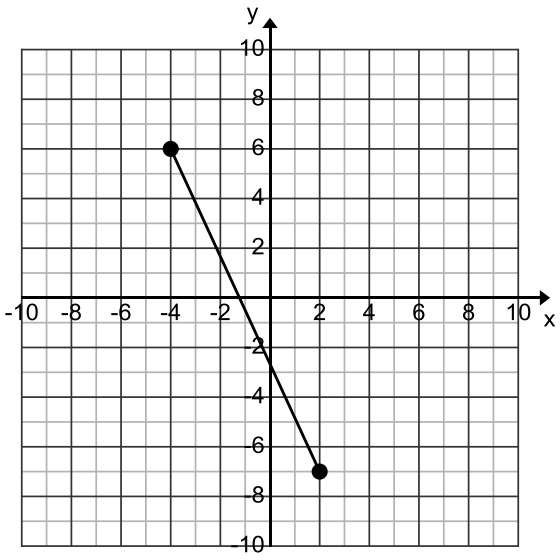
Domain _____

Range _____

Function ? (Yes or No) _____

12). **USING THE GRAPH BELOW, DETERMINE BOTH THE DOMAIN AND THE RANGE:**

DOMAIN _____ RANGE _____



13). **DETERMINE IF EACH OF THE FOLLOWING IS A RELATION OR A FUNCTION**

a). {(- 4, - 1), (-3,0), (- 2, 1) , (-1,2) } _____

b). {(6,1), (6,2), (6,3) } _____

14). **DETERMINE A RELATIONSHIP BETWEEN THE X AND Y VARIABLES. WRITE AN EQUATION.**

x	0	1	2	3	4
y	0	5	10	1 5	20

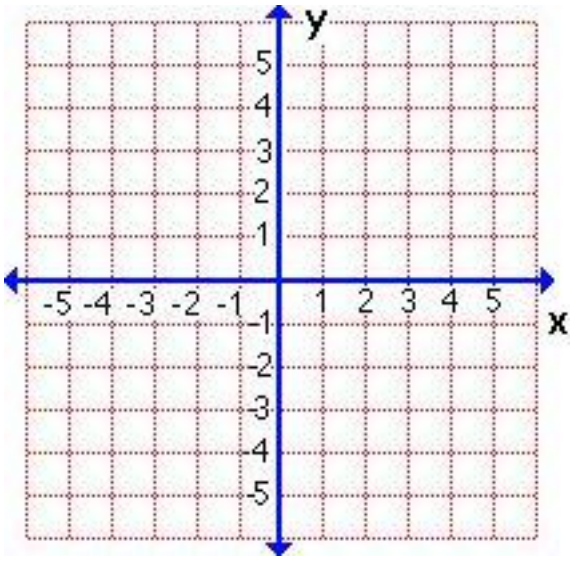
Equation: _____

15). { (3.0), (2, -1), (1, -2), (0, -3) } EQUATION _____

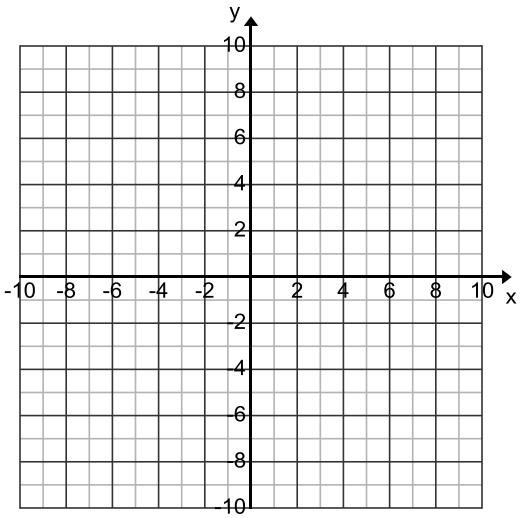
16). **EVALUATE THE FUNCTION F(x) = 6x – 1 WHEN x = 0 AND WHEN x = 5.**

f(0) = f(5) =

17). GRAPH THE FUNCTION: y = 2| x | D: { - 2, -1 0, 1, 2 }

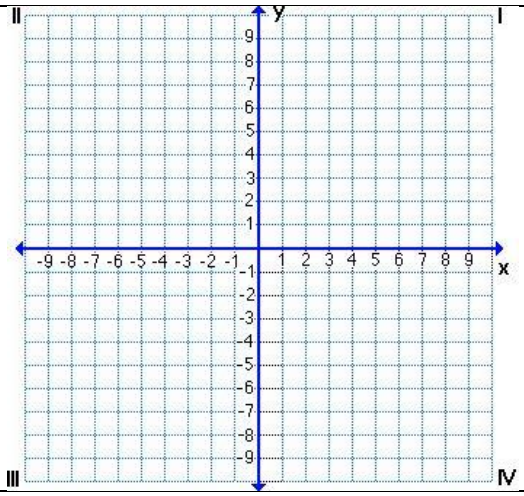


18). $-2x + y = 2$ D: { - 2, - 1, 0, 2 }



19). **GRAPH THE LINE -3x + 2y = - 4 BY COMPLETING THE CHART AND GRAHING THE POINTS:**

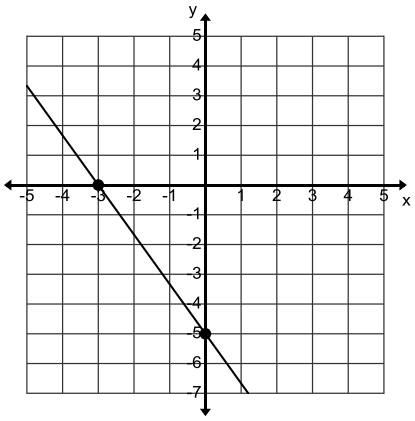
x	y
0	
- 2	
2	



20). **FROM THE GRAPH DETERMINE THE X AND Y INTERCEPTS**

x-intercept = _____

y-intercept = _____

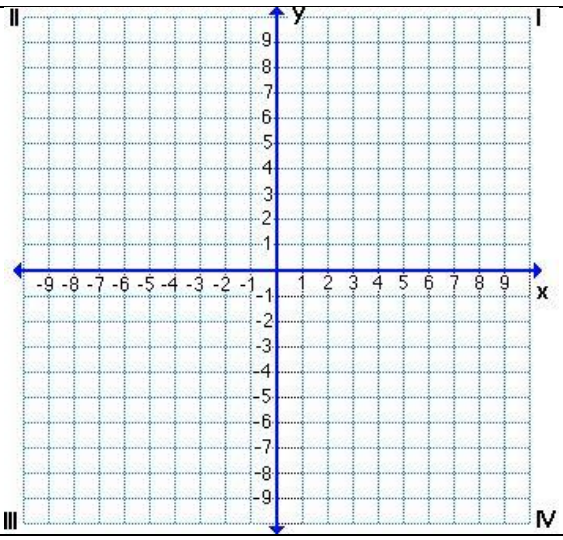


21). **FOR THE EQUATION BELOW, DETERMINE THE X-INTERCEPT AND THE Y-INTERCEPT AND THEN GRAPH THE LINE**

$$-5x + 3y = 15$$

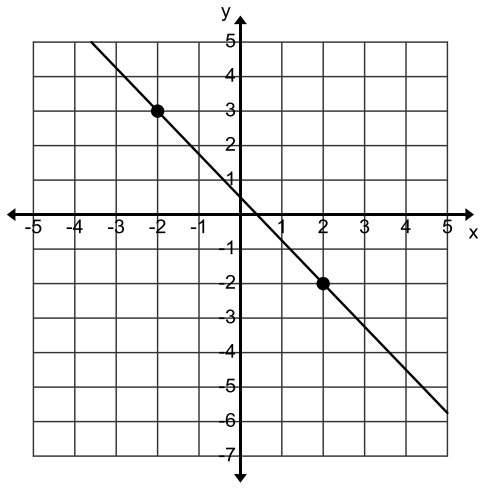
x-intercept = _____

y- intercept = _____



22). **FROM THE GRAPH DETERMINE THE SLOPE OF THE LINE**

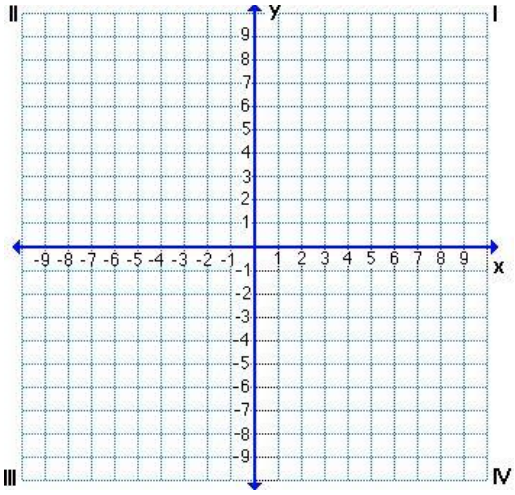
m = _____



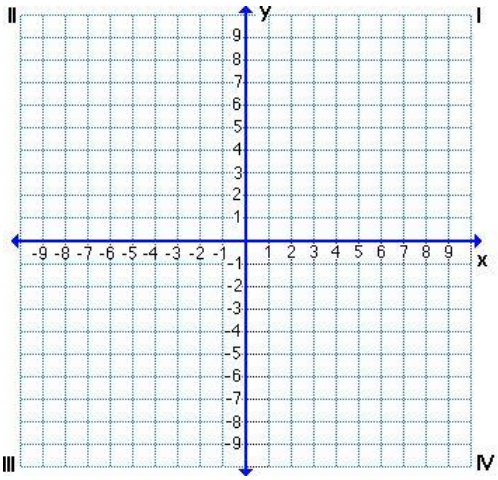
23). **FROM THE EQUATION, DETERMINE THE SLOPE OF THE LINE:**

$6x + 2y = -4$ slope = _____

24). **GRAPH THE LINE WHOSE SLOPE IS 2 AND THE Y-INTERCEPT IS - 4.**



25). **GRAPH THE LINE THAT GOES THROUGH (-3, - 5) AND SLOPE IS** $\frac{5}{2}$

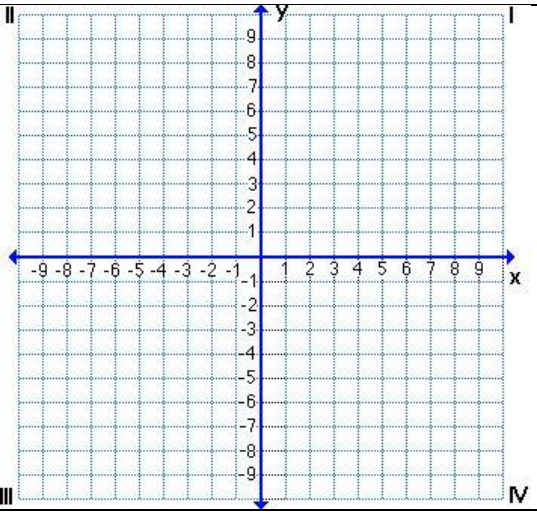


26). **PUT THE EQUATION 2x - 3y = - 3 IN <u>SLOPE INTERCEPT FORM</u>. THEN STATE THE SLOPE AND Y-INTERCEPT AND GRAPH THE LINE.**

Slope-intercept form _____

Slope _____

y-intercept = _____



27. **WRITE AN EQUATION OF A LINE IN BOTH POINT-SLOPE FOR AND SLOPE-INTERCEPT FORM FOR THE LINE WHOSE SLOPE IS $\frac{-2}{3}$ AND GOES THROUGH THE POINT (-6, 2)**

Point-slope form _____

Slope-intercept form _____

28). **WRITE AN EQUATION OF A LINE BOTH IN POINT-SLOPE FORM AND SLOPE INTERCEPT FORM FOR THE LINE THAT GOES THROUGH (7,8) AND (-7,6).**

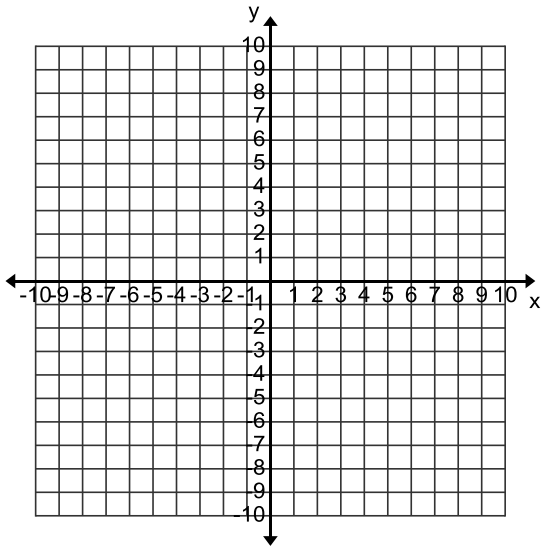
Point-slope form _____

Slope-intercept form _____

DETERMINE IF THE GIVEN POINT IS A SOLUTION TO THE SYSTEM OR INEQUALITY. SHOW ALL WORK

29). (2,0) $3x + y = 6$ $x - y = 2$	30). (6, - 2) $x + y > 4$ $x - y < 10$	31). (-2,3) $3x + 4y > 18$

SOLVE THE FOLLOWING SYSTEM BY GRAPHING:

32). $\begin{cases} y = -x + 2 \\ y = x - 6 \end{cases}$	

SOLVE EACH OF THE FOLLOWING BY SUBSTITUTION. SHOW ALL WORK.

33). $\begin{cases} x = y + 4 \\ x + 7y = 20 \end{cases}$	34). $\begin{cases} 3x - 4y = 3 \\ y = -2x + 2 \end{cases}$	35). $\begin{cases} 2x + 3y = 9 \\ -x + y = -2 \end{cases}$

SOLVE EACH OF THE FOLLOWING BY THE ELIMINATION METHOD:

36). $\begin{cases} 2x - 4y = -4 \\ 2x + 4y = 20 \end{cases}$	37). $\begin{cases} x + y = 2 \\ 2x - y = 1 \end{cases}$	38). $\begin{cases} 9x + 7y = 4 \\ 6x - 3y = 18 \end{cases}$

WITHOUT GRAPHING DETERMINE THE FOLLOWING:
A). THE TYPES OF LINES THAT MAKE UP THE SYSTEM(INTERSECTING, PARALLEL OR SAME LINE)
B). THE NUMBER OF SOLUTIONS (ONE, NONE, INFINITELY MANY)
C). IS THE SYSTEM CONSISTENT OR INCONSISTENT
D). IF THE SYSTEM INDEPENDENT, DEPENDENT OR NEITHER

39). $x + y = 0$
$y = 3x - 12$

a). _____

b). _____

c). _____

d). _____

40). $y = 2x + 5$
$y - 2x = 1$

a). _____

b). _____

c). _____

d). _____

41). $y = \frac{3}{2}x - 4$
$-6x + 4y = 1$

a). _____

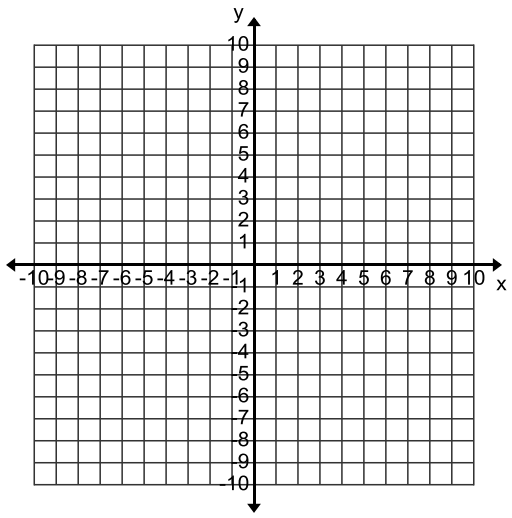
b). _____

c). _____

d). _____

GRAPH THE SOLUTIONS TO EACH OF THE FOLLOWING:

42). $y < x - 3$

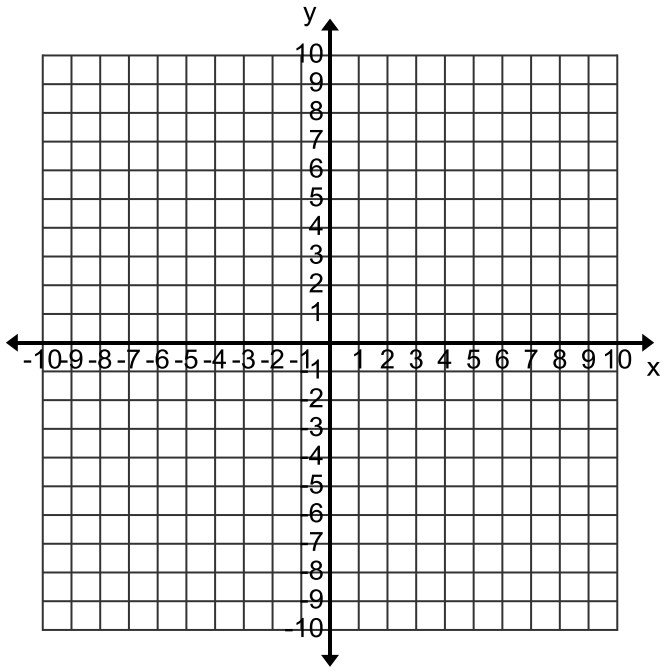


GRAPH THE SOLUTIONS TO THE FOLLOWING SYSTEMS OF INEQUALITIES. THEN DETERMINE TWO POINTS THAT ARE SOLUTIONS, AND TWO POINTS THAT ARE NOT SOLUTIONS.

43).. $\begin{cases} y < -3x + 2 \\ y \geq 4x - 1 \end{cases}$

Two points that are solutions: _____

Two points that are not solutions: _____



SIMPLIFY EACH OF THE FOLLOWING:

44). $(5x^2 + 2x – 7) + (x^2 – 8x + 12) =$ _____

45). $(x^2 – 3x + 8) – (2x^2 – 3x + 7) =$ _____

46). $–2a^2(3a^2 – 2a + 3) =$ _____

47). $(7x – 3y)(2x – 9y) =$ _____

48). $(x + 5)(x^3 – 3x + 4) =$ _____

49). $(3x – 2)(3x + 2) =$ _____

50). $(4x – 5y)^2 =$ _____

FACTOR EACH OF THE FOLLOWING BY REMOVING A GREATEST COMMON FACTOR:

51). $16x^3 – 64x^2 =$

52). $4hk^2 + 16h^2k =$

FACTOR EACH OF THE FOLLOWING AS A DIFFERENCE OF TWO SQUARES:

53). $9t^2 – 1 =$

54). $49x^2 – 81 =$

FACTOR EACH OF THE FOLLOWING BY THE GROUPING METHOD:

55). $6x^3 + 8x + 15x^2 + 20 =$

56). $2m^3 – 6m^2 – 15m + 15$

FACTOR EACH OF THE FOLLOWING TRINOMIALS INTO A PRODUCT OF TWO BINOMIALS:

57). $z^2 - 11z + 18 =$

58). $s^2 - 20s + 36 =$

59). $3p^2 - 7p - 6 =$

60). $2u^2 + u - 21 =$

FACTOR EACH OF THE FOLLOWING AS PERFECT SQUARE TRINOMIALS:

61). $x^2 - 18x + 81 =$

62). $9x^2 + 48x + 64 =$

COMPLETELY FACTOR EACH OF THE FOLLOWING:

63). $5x^2 - 5 =$

64). $6x^2 - 48x + 72 =$

65). $24x^3 - 66x^2 + 15x =$

66). $4x^4 - 38x^3 + 48x^2 =$

SOLVE THE FOLLOWING QUADRATIC EQUATIONS BY EITHER THE SQUARE ROOT METHOD, FACTORING OR THE QUADRATIC FORMULA.

67). $x^2 - 3x - 4 = 0$

68). $2x^2 + 3x = 2$

USE THE PROPERTY OF EXPONENTS TO SIMPLIFY THE FOLLOWING:

69). $(4xy^2)(3x^{-4}y^5)$ =

70). $(2x)^3(3x)^3$ =

71). $\frac{12x^2y^3z^{-2}}{21xy^2z^3}$ =

72). $\frac{3ab^{-2}c^4)^3}{(2a^{-1}b^2c^{-3})^2}$ =

WRITE THE FOLLOWING IN SIMPLEST RADICAL FORM:

73). $\sqrt{180}$ =

74). $\sqrt{162c^4d^5}$ =

75). $\sqrt{2x^3y}\sqrt{12xy}$ =

76). $\sqrt{\frac{9a^2}{8b}}$ =

77). $\sqrt{\frac{2x^2 2y^3}{25z^4}}$ =

78). $\sqrt{12}$ - $\sqrt{27}$ + $\sqrt{75}$ =