



**UNIVERSITY OF DETROIT JESUIT**  
**HIGH SCHOOL AND ACADEMY**

## **Algebra II/Trig Summer Packet**

- The following set of problems are designed to provide practice with fundamental skills learned in Algebra 1.
- This will be collected on the first day of school in the fall.
- Show your work for these problems in the packet.
- Pace yourself working on these throughout the summer. These should not be completed the evening before the first day of school!

Have a good summer and we will see you in August!

Simplify each expression:

1.  $5(y - 4) - 3(2y - 9)$

2.  $25x + 14 - 17 - 6x$

3.  $6y + 12x - 12y - 9x$

4.  $6(n - 2) - 8n + 40$

5.  $7t^4 + 7t^2 - 2t^2 - 9t^4$

Solve each equation:

6.  $4n - 2(3 - n) = -13$

7.  $\frac{3y + 2}{4} = 7$

8.  $\frac{25x}{5} - 7x = 12$

9.  $-\frac{21x}{7} - 5x = 24$

10.  $30 - 2x = -3(x + 2) - 5x$

11.  $-(-x + 4) - 3x = -7x + 16$

12.  $-2(4v - 8) = 8(v + 2)$

13.  $-3a - 6(1 - 4a) = -(5a + 6)$

Write the slope-intercept form of the equation of each line. Then solve for  $y$  when  $x = 2$ .

14.  $6x + y = -1$

15.  $x + y = 5$

16.  $5x + 4y = -3$

17.  $x + 5y = 5$

18. Find the  $x$  and  $y$  intercepts of the line  $6x - 3y = -54$ .

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

19.  $(-18, 1), (-10, 4)$

20.  $(-14, -13), (-5, -4)$

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

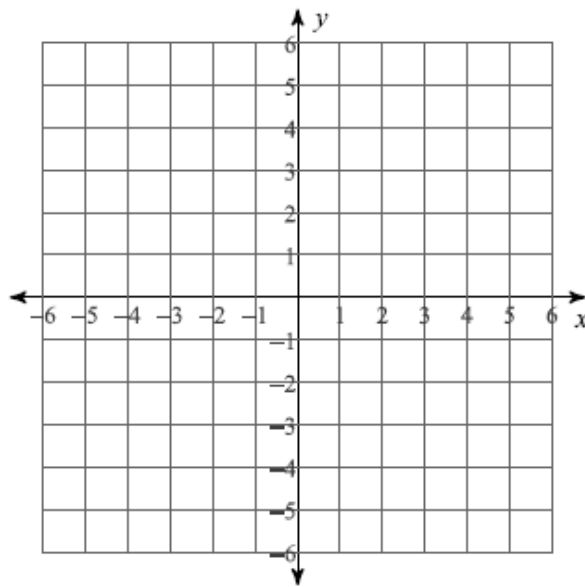
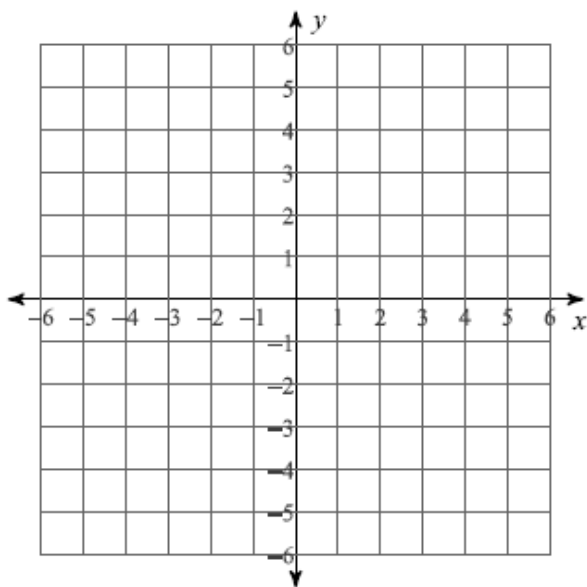
21. through:  $(-1, 1)$  and  $(0, 5)$

22. through:  $(-5, -3)$  and  $(4, 5)$

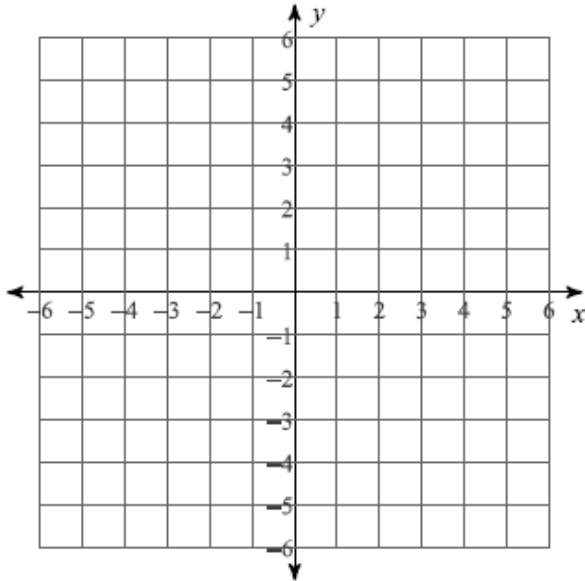
Sketch the graph of each line:

23.  $3x + 4y = 8$

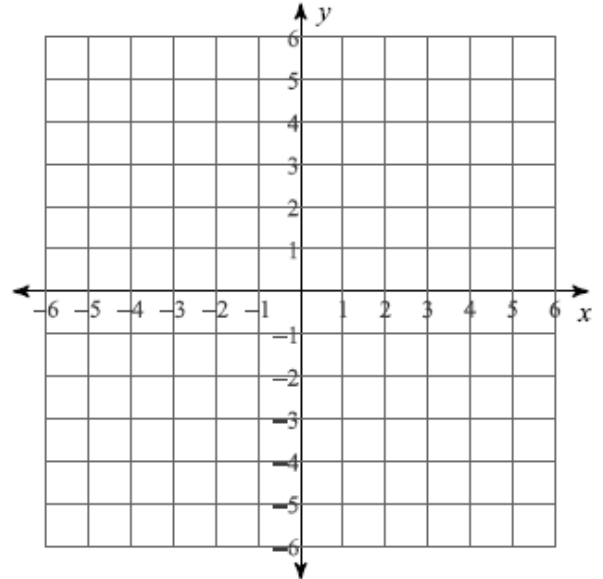
24.  $x - 3y = -12$



25.  $x$ -intercept = 3,  $y$ -intercept = 5

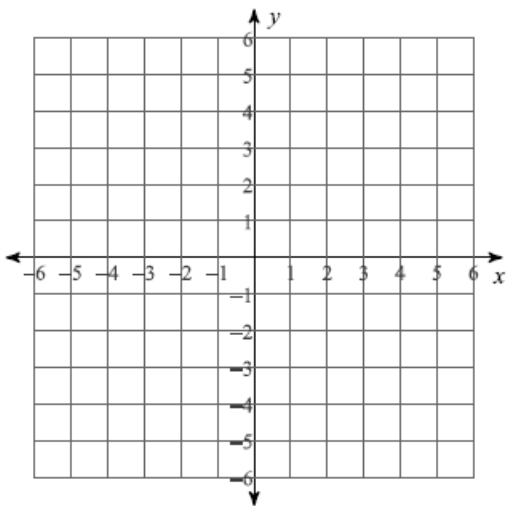


26.  $y = \frac{3}{5}x + 1$

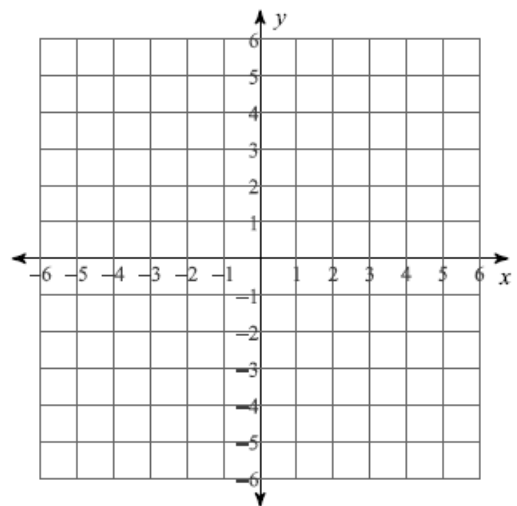


Graph each inequality:

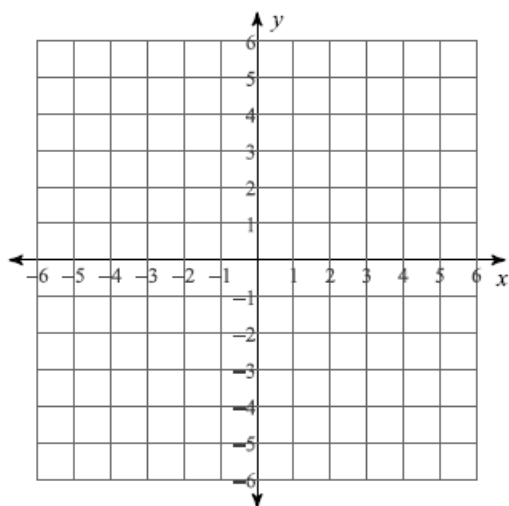
27.  $y < -1$



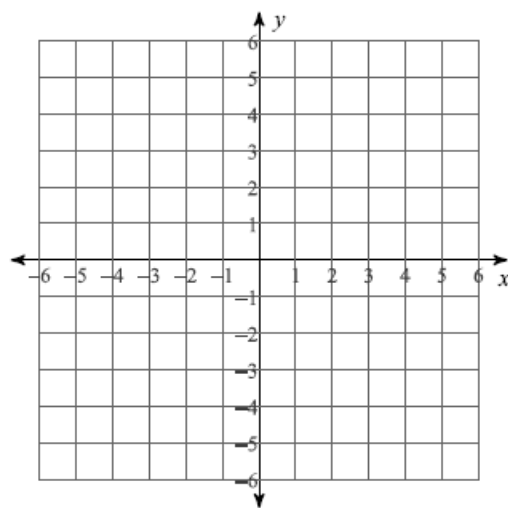
28.  $y \leq -x + 1$



29.  $7x - 5y \leq 20$



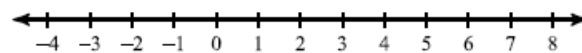
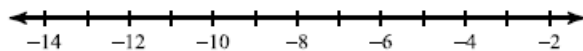
30.  $x < 3$



Solve each inequality & graph the solution set on the number line:

31.  $8n > -56$  or  $n - 4 < -13$

32.  $-2 + x \leq 3$  and  $x - 8 \geq -11$



Solve each absolute value equation:

33.  $|10 + 5r| = 15$

34.  $|7 - 10b| = 13$

$$35. \quad 4 \left| \frac{n}{6} \right| - 8 = -6$$

$$36. \quad 2 - 10 |n - 4| = -68$$

Solve each system of equations:

$$37. \quad \begin{aligned} y &= 2x - 4 \\ y &= 3x \end{aligned}$$

$$38. \quad \begin{aligned} 3x - 2y &= -13 \\ y &= -3x - 7 \end{aligned}$$

$$39. \quad \begin{aligned} 2x - 5y &= 4 \\ 3x + 5y &= 6 \end{aligned}$$

$$40. \quad \begin{aligned} 3x - 4y &= 21 \\ 4x + 2y &= 6 \end{aligned}$$

$$41. \quad 3x + 2y = -5$$

$$4x - 3y = 16$$

Simplify each expression. (No negative exponents)

$$42. \quad 3x^3 \cdot 3x$$

$$43. \quad 3x \cdot x$$

$$44. \quad 4x^3 \cdot x^4$$

$$45. \quad 3x^4 \cdot 3x^2$$

$$46. \quad (-4e^4 f^2 g)^3$$

$$47. \quad (-2d^6 e^5 f^3)^4$$

$$48. \quad (-3b^6 cd^5)^2$$

$$49. \quad (-3x^{-2})^3$$



50.  $\left(\frac{y^8}{z^6}\right)^7$

51.  $\left(\frac{r^2}{s^9}\right)^3$

52.  $\frac{6x^2}{y^3} \cdot \frac{y^{-2}x^3}{9x^2}$

53.  $(-2x^{-3})^2$

54.  $\frac{4x^3}{y^2} \cdot \frac{y^{-3}x^{-2}}{8x^{-1}}$

55.  $(-3x^{-2})^{-3}$

56.  $\frac{12x^{-3}}{y^4} \cdot \frac{(y^{-2}x^2)^{-1}}{15x^{-2}}$

Factor each expression completely:

57.  $k^2 + 2k - 35$

58.  $5x^2 + 10x - 40$

59.  $m^2 - 3m - 28$

60.  $14n^2 - 4n$

61.  $25b^2 - 155b - 140$

62.  $5x^2 - 14x - 3$

63.  $4r^2 - 39r - 10$

64.  $50r^2 - 15r - 90$

65.  $-24n^2 + 114n - 105$

66.  $54x^2 + 348x + 144$

67.  $9p^2 - 16$

68.  $25r^3 + 30r^2 - 10r - 12$

69.  $6v^3 - 4v^2 - 21v + 14$

70.  $24x^3 + 56x^2 - 9x - 21$

71.  $7b^3 + 21b^2 + 6b + 18$

Solve each equation by factoring:

72.  $x^2 = -x + 6$

73.  $n^2 + 6n = -9$

74.  $7r^2 = -46r + 21$

75.  $7x^2 = -3x$

76.  $4k^2 - 27k = -35$

Solve each equation by completing the square:

77.  $x^2 + 10x + 5 = -4$

78.  $k^2 - 20k - 76 = -7$

79.  $n^2 - 20n - 72 = -5$

Solve each equation by using the quadratic formula:

80.  $8a^2 + 4 = 652$

81.  $25x^2 + 3 = 12$

82.  $2n^2 - 3 = -39$

Solve each equation by using the quadratic formula:

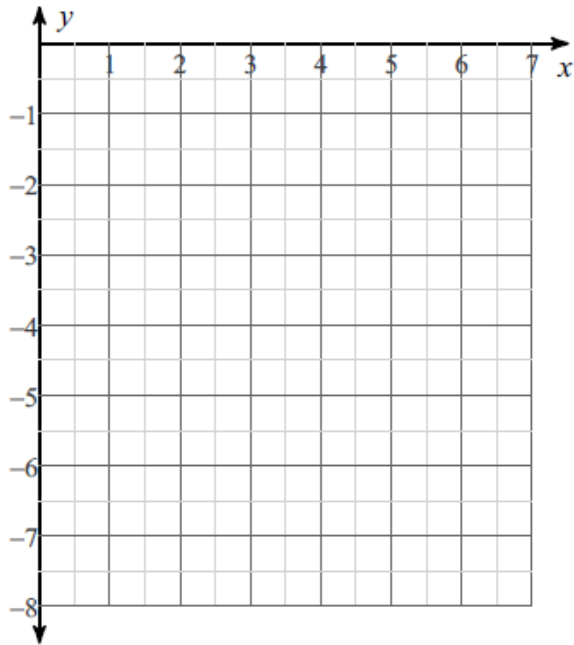
83.  $n^2 - 56 = -n$

84.  $2x^2 = 10x + 132$

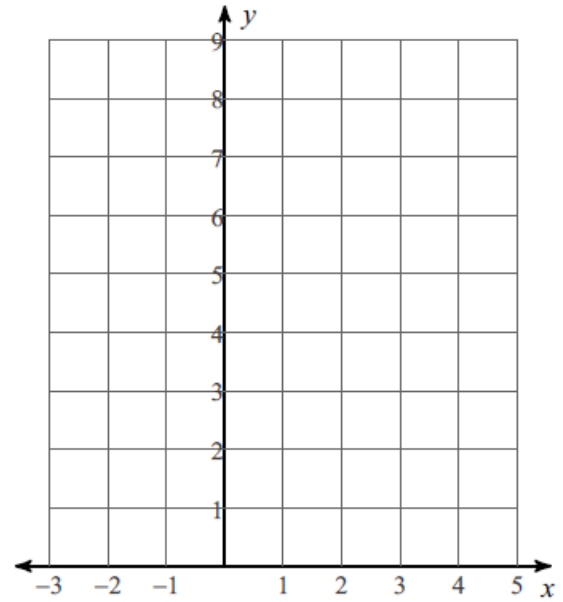
85.  $3n^2 + 7n = -2$

Sketch the graph of each function. Label the vertex and two other points on the graph.

86.  $y = -x^2 + 8x - 19$



87.  $y = x^2 - 2x + 5$



88.  $y = 2x^2 - 8x + 7$

