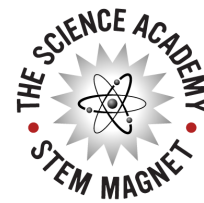


Algebra II Summer Enrichment

For OUTGOING GEOMETRY STUDENTS ONLY

Science Academy STEM Magnet



This summer assignment is all review of material that you should have learned in Algebra I. However, that was a year ago, and some of the material may be difficult to remember. All of this material is foundational for Algebra II, so spend the last two weeks of summer using your independent research skills to refresh your memory on these subjects. Spend the first day budgeting your time for the two weeks.

Make sure to show your work clearly. Use extra paper if you need to.

When you return, you should have the entire packet completed (You may need to include extra paper to show some of your work). In addition, I would like you to rate each section twice on a scale of 1 to 5: first for how well you understood the material before doing the review, second for how well you understood it afterwards. Honesty is more important than ranking everything at a five.

Subject	Before	After	Date(s)
Order of operations			
Simplifying expressions			
Solving equations			
Solving and graphing inequalities			
Graphing linear equations			
Writing equations			
Solving systems of equations			
Simplifying exponents			
Multiplying polynomials			
Factoring polynomials			
Parabolas			
Completing the square			
Radical expressions			
Rational Expressions			

Name: _____
Parent email: _____

Evaluate each expression. (Order of operations)

1) $(4 - 2) \cdot -\frac{6}{10 - 4}$

2) $-10 + -\frac{16}{4} - (5 - -6)$

3) $-7 + (-10 - 5)(3 - 10)$

4) $-3 - -3 - (2 - 4)^3$

5) $-\frac{1}{(-1)^3} \cdot 8 - -3$

6) $(8 - 5)(10 - (-4)^2)$

Evaluate each using the values given.

7) $(2jk)(j^2)$; use $j = -2$, and $k = 4$

8) $4 + (y + y)(x + z)$; use $x = 4$, $y = -6$, and $z = -1$

9) $zy - 5x - 5$; use $x = -7$, $y = -7$, and $z = -9$

10) $(z)(y - (y - x) + z)$; use $x = 4$, $y = -5$, and $z = -2$

Simplify each expression. (Distributive property & Combining like terms)

11) $1 + 5a + 7a - 10$

12) $-4x - 8x$

13) $-2(10k - 6)$

14) $-4(4 + 6n)$

15) $-7(8x + 2) - 2$

16) $-3(10n + 6) + 10n$

17) $-5(b - 1) - 9(b + 2)$

18) $-8(n - 6) - 5(n - 2)$

Solve each equation.

19) $-4 = -3 + \frac{x}{9}$

20) $59 = 8n - 5$

21) $36 = 5n + 6$

22) $-2(x - 4) = 16$

23) $p + 6 = 7p + 7 + 2p + 7$

24) $n + 1 - 4n = -3n - 3$

25) $7(6 - 3p) = -23 - 8p$

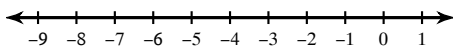
26) $2(m - 4) = -5 + 3m$

27) $-(n - 6) + 4n = 3n + 6$

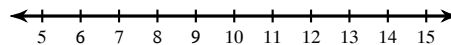
28) $5(2x - 3) = -25 + 8x$

Solve each inequality and graph its solution.

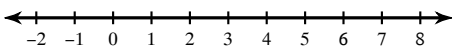
29) $-\frac{2}{13} \geq \frac{x}{13}$



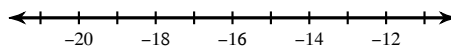
30) $11 + b \leq 21$



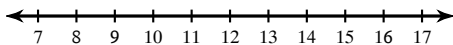
31) $-11b \leq -33$



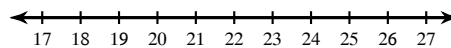
32) $-16 \leq a + 1$



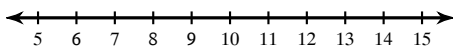
33) $-8(v + 5) \geq -160$



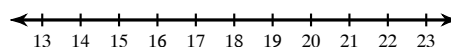
34) $5 \geq 4 + \frac{n}{20}$



35) $-8(10 + p) \geq -136$

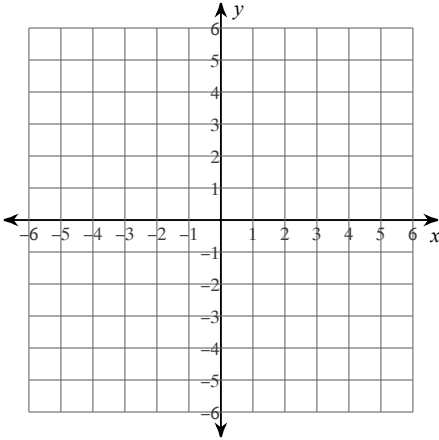


36) $1 > \frac{-2 + v}{15}$

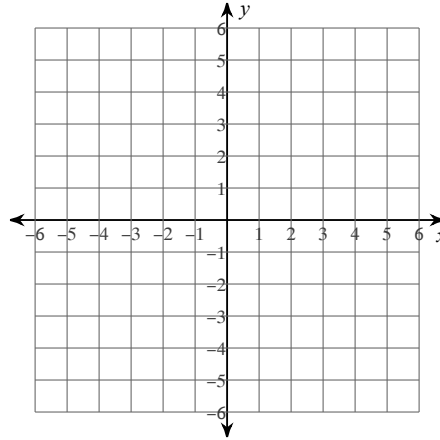


Sketch the graph of each line.

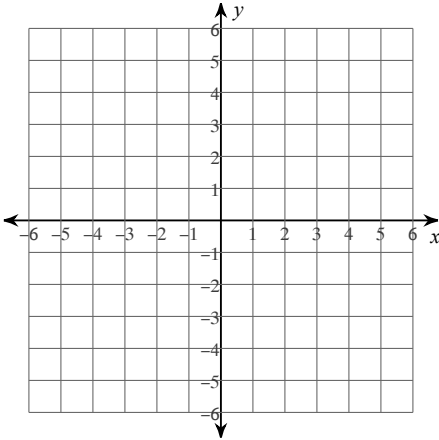
37) $x + y = -4$



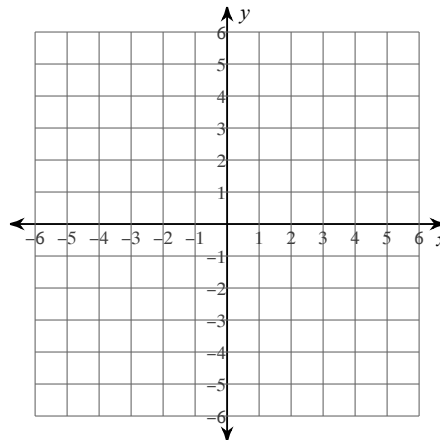
38) $y = -4$



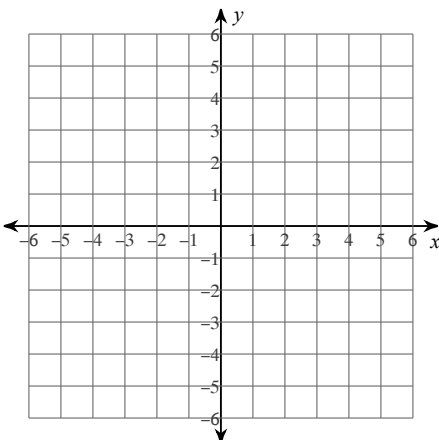
39) $x + 2y = 6$



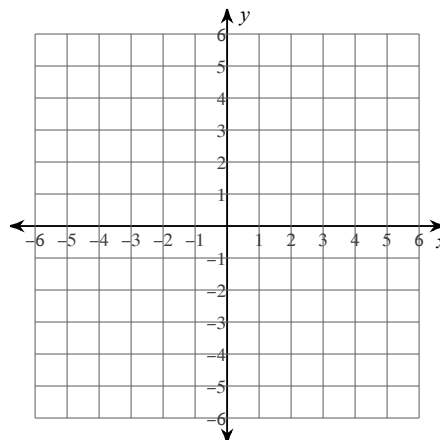
40) $y = \frac{3}{5}x - 3$



41) $y = -\frac{7}{2}x + 2$

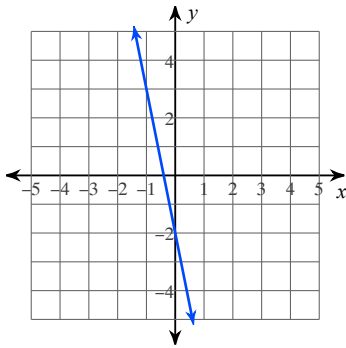


42) $y = \frac{5}{3}x + 5$

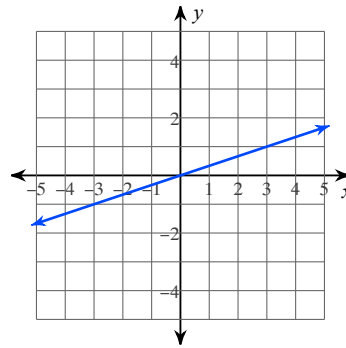


Write the slope-intercept form of the equation of each line.

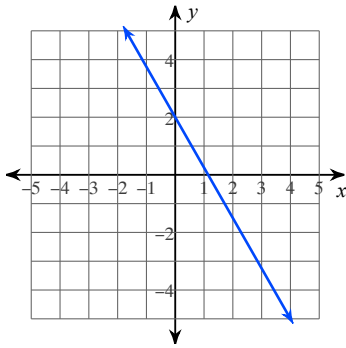
43)



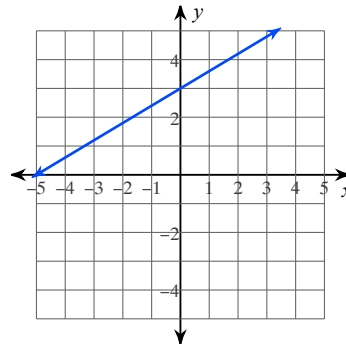
44)



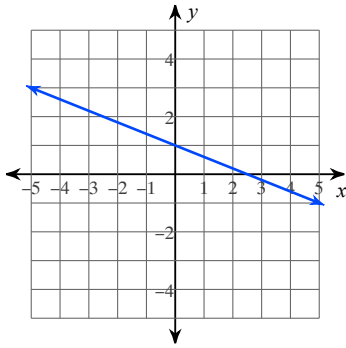
45)



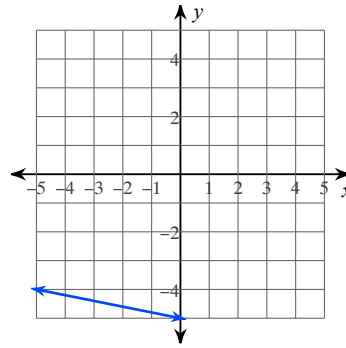
46)



47)



48)



Write the slope-intercept form of the equation of the line for the given information

49) through: $(-2, -5)$, slope = 4

50) through: $(-2, 2)$, slope = $-\frac{7}{2}$

51) through: $(-3, 2)$ and $(0, -5)$

52) through: $(4, 1)$ and $(0, -2)$

53) through: $(0, 5)$ and $(-3, 3)$

54) through: $(-5, 1)$ and $(0, 3)$

Solve each system (Use substitution or elimination as appropriate)

$$\begin{aligned} 55) \quad & 6x + 5y = 8 \\ & y = -8x + 22 \end{aligned}$$

$$\begin{aligned} 56) \quad & 3x - 5y = 12 \\ & y = 5x + 24 \end{aligned}$$

$$\begin{aligned} 57) \quad & -2x + 4y = 4 \\ & x - 2y = -2 \end{aligned}$$

$$\begin{aligned} 58) \quad & -4x - 4y = 0 \\ & -2x + y = 9 \end{aligned}$$

$$\begin{aligned} 59) \quad & -2x + 7y = 19 \\ & 2x - 3y = 1 \end{aligned}$$

$$\begin{aligned} 60) \quad & -3x + 3y = 30 \\ & 3x + y = -14 \end{aligned}$$

$$\begin{aligned} 61) \quad & -3x - y = 7 \\ & -3x - 6y = 27 \end{aligned}$$

$$\begin{aligned} 62) \quad & 7x - 3y = 8 \\ & x - 3y = -22 \end{aligned}$$

$$\begin{aligned} 63) \quad & -x + 4y = -4 \\ & 4x - 8y = 16 \end{aligned}$$

$$\begin{aligned} 64) \quad & -10x - 40y = 0 \\ & -2x - 8y = 0 \end{aligned}$$

Simplify. Your answer should contain only positive exponents. (Exponent rules)

65) $2xy^4 \cdot 3x^2y^3$

66) $a^{-3}b^4 \cdot 2a^3b^3 \cdot 3a^0b^{-3}$

67) $4m^2n^{-4} \cdot 2m^0n^4$

68) $2u \cdot 4v^{-2}$

69) $2x^0y^0 \cdot 3y^{-4}$

70) $x^4y^4 \cdot 2x^0y^4$

Find each product. (Multiplying polynomials)

71) $(7b + 2)(b - 1)$

72) $(5x - 5)(4x + 1)$

73) $(7v - 7)(5v + 4)$

74) $(7x - 5)(2x - 2)$

Factor each completely. (Factoring polynomials)

75) $5k^2 - 35k - 150$

76) $x^2 + 2x - 48$

77) $6v^2 - 56v + 64$

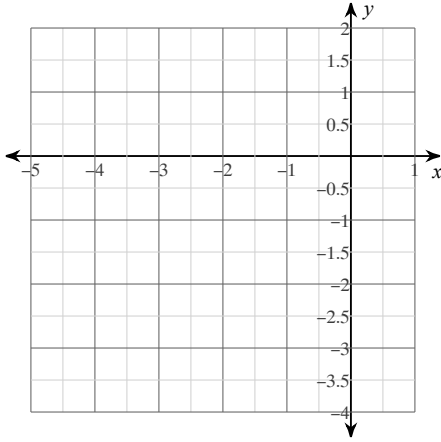
78) $7x^2 + 2x$

79) $36v^2 + 72v + 32$

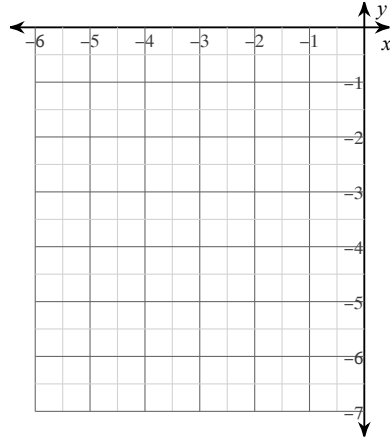
80) $27n^2 - 162n$

Sketch the graph of each function. Label the vertex, axis of symmetry, and all intercepts.

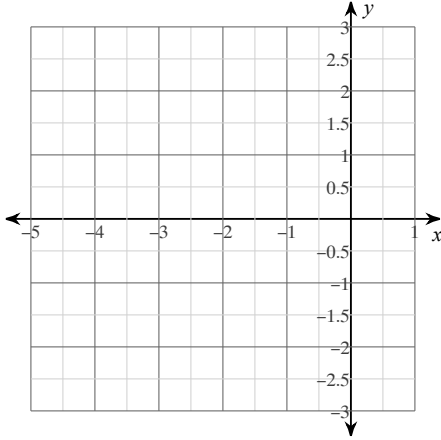
81) $y = x^2 + 4x + 1$



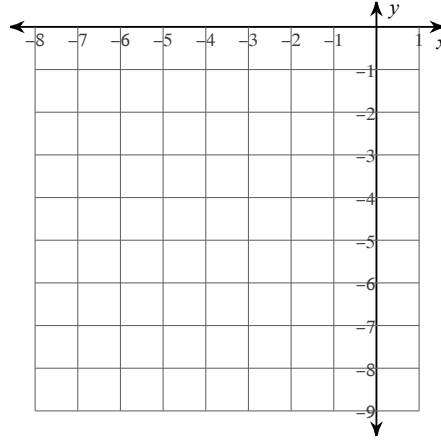
82) $y = -x^2 - 6x - 11$



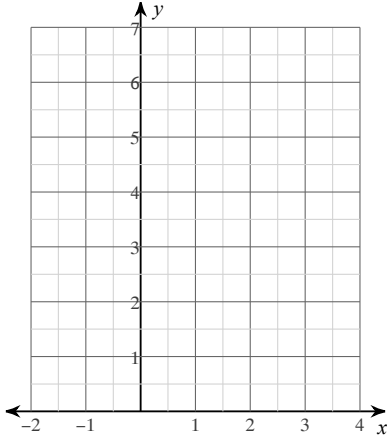
83) $y = x^2 + 6x + 7$



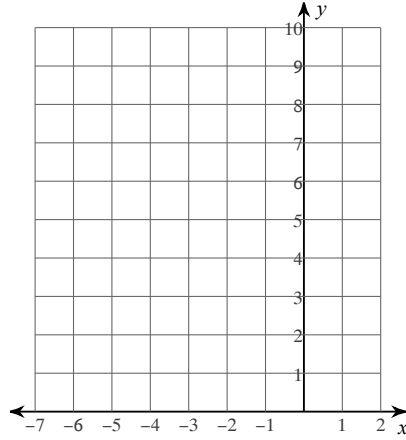
84) $y = -x^2 - 8x - 20$



85) $y = x^2 - 2x + 3$



86) $y = 2x^2 + 16x + 33$



Find the value of c that completes the square.

87) $n^2 + 10n + c$

88) $x^2 + 17x + c$

89) $x^2 - 17x + c$

90) $x^2 + 5x + c$

Solve each equation by completing the square.

91) $n^2 - 16n - 62 = -5$

92) $7n^2 - 14n + 94 = 2$

93) $r^2 + 20r + 42 = 6$

94) $x^2 - 12x - 83 = 2$

95) $4x^2 - 8x - 105 = -9$

96) $x^2 - 6x - 31 = -4$

Simplify. (Radical expressions)

97) $2\sqrt{12} - 3\sqrt{2} + 2\sqrt{8}$

98) $2\sqrt{45} - 2\sqrt{5} - \sqrt{3}$

99) $-2\sqrt{5} - 3\sqrt{6} - \sqrt{20}$

100) $-3\sqrt{8} - 2\sqrt{2} - \sqrt{2}$

101) $\sqrt{5}(\sqrt{5} + 3)$

102) $\sqrt{5}(\sqrt{6} - 2\sqrt{5})$

103) $5\sqrt{15}(5 - 4\sqrt{3})$

104) $4\sqrt{6}(\sqrt{6} + 5\sqrt{10})$

Simplify each and state the excluded values. (Rational Expressions)

105) $\frac{4x^2 + 24x}{x + 6}$

106) $\frac{p^2 + 19p + 90}{p + 9}$

107) $\frac{n^2 - 15n + 56}{n - 8}$

108) $\frac{5 - x}{x^2 - 4x - 5}$

Simplify each expression. (Rational Expressions)

$$109) \frac{3n}{n-6} \cdot \frac{8n^3 - 48n^2}{8n^2}$$

$$110) \frac{10-x}{8-x} \cdot \frac{x^2 - 13x + 40}{x-10}$$

$$111) \frac{7x}{x-2} \cdot \frac{x+8}{4x+32}$$

$$112) \frac{10v^3 - 40v^2}{v-4} \cdot \frac{v-9}{10v^2}$$

$$113) \frac{1}{p-2} \div \frac{4p^2}{p^2 + p - 6}$$

$$114) \frac{1}{k+4} \div \frac{k^2 + 5k - 6}{8k^2 - 8k}$$

$$115) \frac{x^2 - 9x + 18}{-x^2 + 9x - 18} \div \frac{8}{x+9}$$

$$116) \frac{n-4}{n^2 - 4n - 12} \div \frac{n-7}{n^2 - 4n - 12}$$

$$117) \frac{6n}{3n+2} - \frac{2}{2n-2}$$

$$118) \frac{5}{6b^3 - 24b^2} + 5b$$

$$119) \frac{2x}{3x^2 + 18x} + \frac{3}{2}$$

$$120) \frac{3r}{3} - \frac{6}{2r-12}$$