Algebra 2 Name_____

Summer Review Packet

Date_____

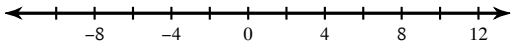
1) I am excited for a great year learning Algebra 2 with you. Given that you haven't seen Algebra for a few years, this year's summer review packet is very important to help you start off the year with a strong foundation.

The problems get incrementally more difficult within each section. The problems start at a PreAlgebra or Algebra 1 level and progress to entry level Algebra 2. You should be able to do all but the last problem in each section. Give each problem your best effort and SHOW ALL YOUR WORK!

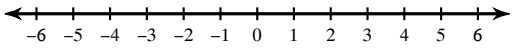
You may need to take extra time to refresh on material you learned in Algebra 1. Khan Academy and Mathway are great resources. For a small annual fee Mathway will show you each step required to solve a given problem and is often a great resource over the year.

Solve each inequality and graph its solution.

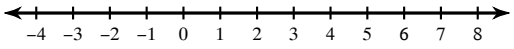
2) $|v| \geq 8$



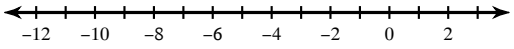
3) $|6p + 8| < 14$



4) $10|8v + 8| < 80$



5) $-8|7 + 2m| + 1 \leq -55$



Simplify. (Hint: Using Prime Factor Trees will help.)

6) $\dfrac{\sqrt{99}}{\sqrt{100}}$

7) $\dfrac{6\sqrt{63}}{2\sqrt{100}}$

8) $\dfrac{\sqrt{96}}{6\sqrt{12}}$

9) $\dfrac{4}{4\sqrt{5}-4\sqrt{3}}$

Simplify each expression.

10) $\dfrac{7n^3}{6n}\cdot\dfrac{6n}{8n}$

11) $\dfrac{9n}{3}\cdot\dfrac{4}{7}$

12) $\dfrac{1}{7n+4}\cdot\dfrac{6n(7n+4)}{50}$

13) $\dfrac{4}{7a}\div\dfrac{6}{5a}$

14) $\dfrac{(b+9)^2}{(b+9)(b+4)}\div\dfrac{10}{b+4}$

15) $\dfrac{8(8-b)}{b-8}\div\dfrac{3(b-10)}{3}$

Solve each equation.

16) $-5(6p + 7) = -95$

17) $-235 = -8x + 3(7 - 8x)$

18) $-33 = 7(k + 3) - 2(-6k + 8)$

19) $30 = -7(v + 1) + 6(1 - 4v)$

20) $-n - 6n = -3(4n - 5) + 5(n + 6)$

21) $3(n + 6) = -(6 - 5n)$

22) $-6 - 5p + 5 = -5(1 - 3p) - 4(3 + 7p)$

23) $-4(x + 1) + 11 = 3 - 4(x - 1)$

Solve each equation. If the equation isn't already factored you must factor in order to solve.

24) $(6x - 5)(x + 5) = 0$

25) $(b - 5)(b + 5) = 0$

26) $b^2 - 4b - 12 = 0$

27) $p^2 - 6p = 0$

28) $r^2 + 9r + 24 = 4$

29) $7n^2 - 8n = 0$

30) $5n^2 - 2n = 0$

31) $4k^2 - 13k + 4 = -6k^2$

Solve each equation with the quadratic formula.

32) $2x^2 + 10x - 132 = 0$

33) $2x^2 - 12x - 110 = 0$

34) $8k^2 + 2k - 2 = 0$

35) $2a^2 + a - 24 = -10$

Simplify.

36) $x^2 \cdot 3x^3$

37) $(3n^3)^2$

38) $\frac{x^2}{x}$

39) $\frac{p \cdot 3p^3}{(2p^2)^3}$

40) $\frac{(3r^3)^3}{r^3 \cdot r \cdot r}$

41) $\frac{b^3}{2b^2 \cdot 2b^2}$

Factor each completely. (Use all the methods you have learned: Factor out GCF first then use Grouping, Splitting the Middle Term, Factors and Sums, special patterns like difiference of squares and perfect squares)

42) $p^2 - 12p + 27$

43) $k^2 + 11k + 18$

44) $20x^3 - 12x^2 + 5x - 3$

45) $18m^3 + 48m^2 - 21m - 56$

46) $24m^3 - 64m^2 - 15m + 40$

47) $21m^3 - 56m^2 - 15m + 40$

48) $6x^2 - 66x + 108$

49) $4m^2 - 16m - 240$

50) $3p^2 - 24p - 27$

51) $16x^2 - 96x + 108$

52) $36v^2 + 136v - 32$

53) $40a^2 + 436a + 360$

54) $25n^2 - 1$

55) $n^2 - 16$

56) $x^2 - 2x + 1$

57) $25x^2 - 30x + 9$

Evaluate each function.

58) $f(x) = 2x$; Find $f(-5)$

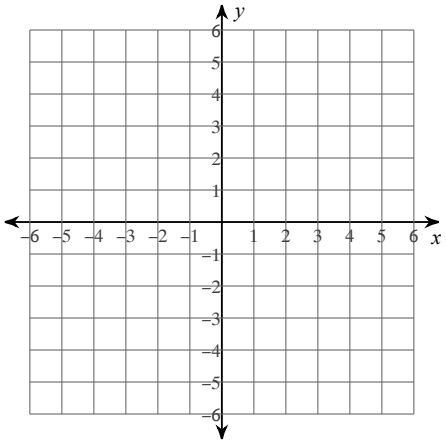
59) $f(x) = 2x - 5$; Find $f(2)$

60) $f(x) = 2 \cdot 3^x + 2$; Find $f(2)$

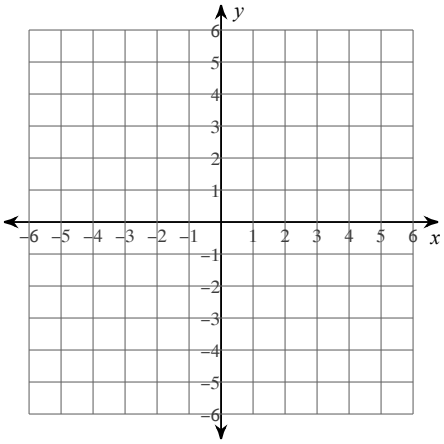
61) $f(t) = |t|$; Find $f(-1)$

Sketch the graph of each line. (Graph using x and y intercepts and using slope intercept form.)

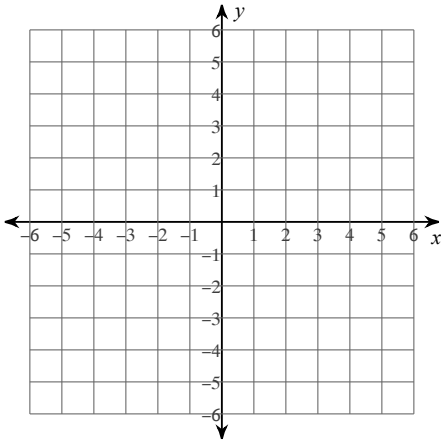
62) $x - 5y = 10$



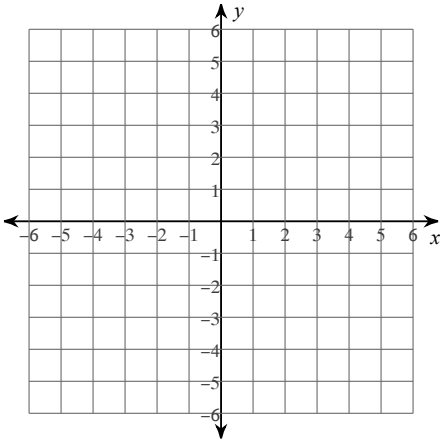
63) $5x + 2y = -6$



64) $y = -\frac{3}{2}x - 5$

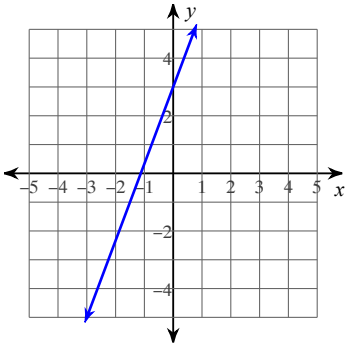


65) $y = -x - 5$



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

66)



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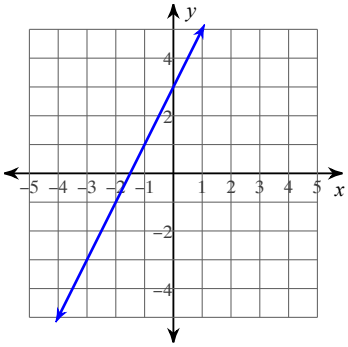
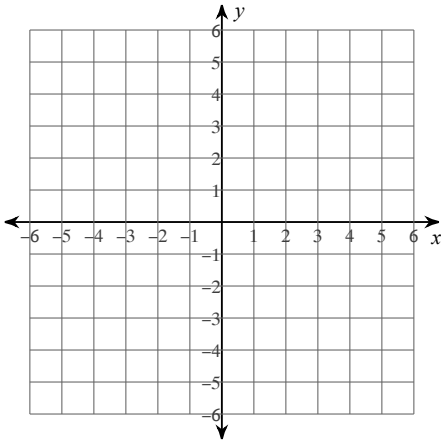
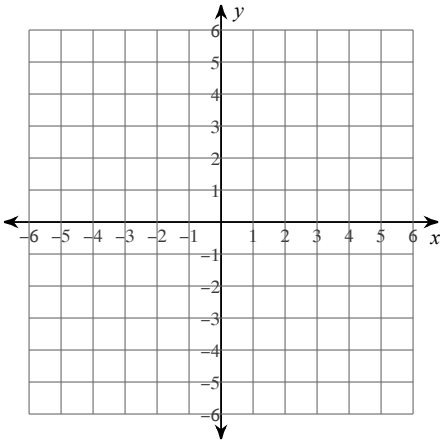


Sketch the graph of each linear inequality.

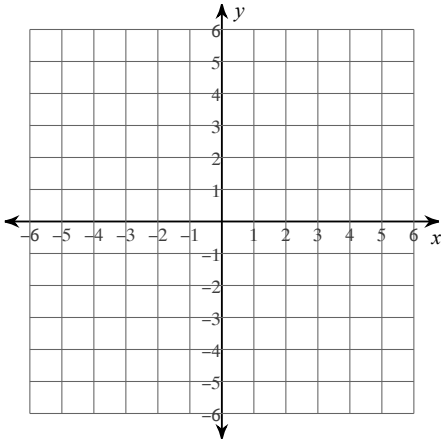
68) $8x - y \leq 4$



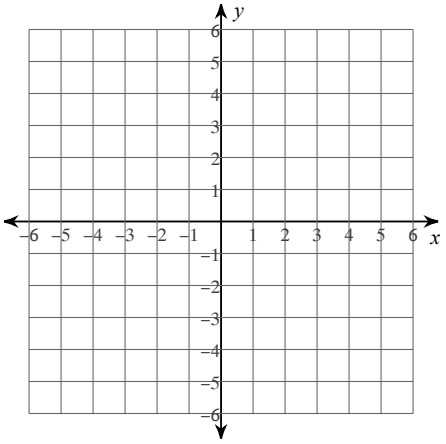
69) $4x + y > -1$



70) $y \geq -\frac{5}{3}x$



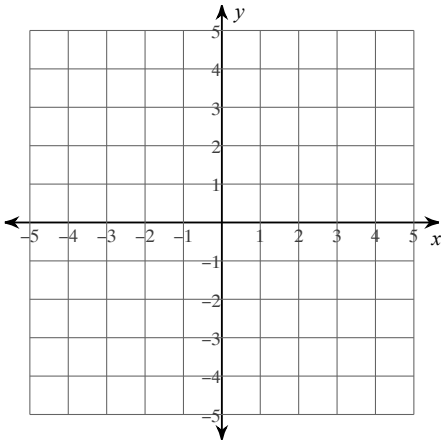
71) $y \geq \frac{2}{3}x$



Solve each system by graphing, which means to find where the graphs share common point(s). You may want to use a ruler to help clearly see the intercepts.

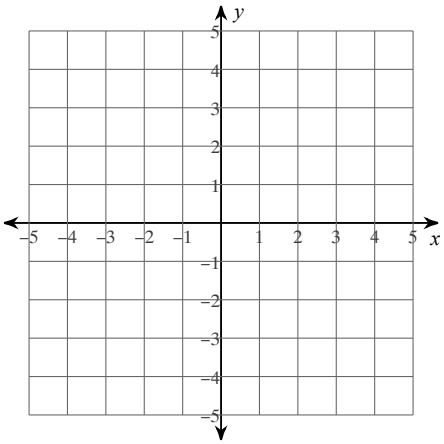
72) $y = \frac{3}{4}x - 1$

$y = -\frac{1}{4}x + 3$



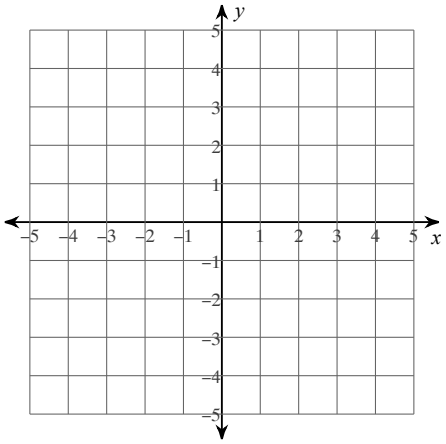
73) $y = -4x - 4$

$y = -x + 2$



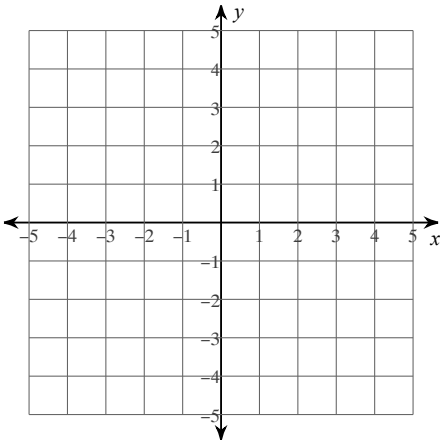
74) $y = -\frac{4}{3}x - 3$

$y = -\frac{4}{3}x - 4$



75) $y = -x + 4$

$y = 4x - 1$



Write the slope-intercept form of the equation of each line given the slope and y-intercept.

76) Slope $= \frac{2}{3}$, y-intercept $= -4$

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

77) through: $(0, -3)$, slope = 4

Write the slope-intercept form of the equation of the line described. Hint: Parallel lines have the same slope. Perpendicular lines have slopes that are opposite reciprocals.

78) through: $(0, -3)$, parallel to $y = 7x - 4$

79) through: $(1, -5)$, parallel to $y = -7x + 4$

80) through: $(0, 1)$, perp. to $y = -\frac{2}{3}x + 3$

81) through: $(-2, -2)$, perp. to $y = \frac{1}{3}x + 2$

Simplify each expression.

82) $\frac{u + v}{36v} + \frac{6u}{36v}$

83) $\frac{4a}{15b^2} + \frac{a - b}{15b^2}$

Find each product.

84) $(-2x - 1)(3x - 7)$

85) $(-8a + 2)(-3a + 4)$