Algebra 2 Level 2

Summer Packet

This packet of exercises reflects skills that the Math Department considers essential for your success in Algebra 2!

In this packet you will find the following:

- Questions on material previously learned. (Some material you may not have seen due to adjustments made during virtual learning)
- Topics from Khan Academy referenced in the directions for each problem set. If you are having difficulty recalling how to do a specific type of problem, the Khan Academy videos are an excellent resource for re-teaching. Go to www.khanacademy.org, type in the phrase provided, and it will take you to a video(s) about the topic. Khan Academy also provides further practice on the topics that you can do for your own self-assessment.

Your Responsibility is to:

- DO YOUR BEST to complete all problems and show all necessary work **clearly and carefully**
- Turn in the packet on **THE FIRST DAY OF SCHOOL**! It will be collected and checked for completion on the first day of school.

You will be tested on the material within the first two weeks of school.

Have a great summer!

Summer Packet Name_____

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Algebra 2-2 Date_____

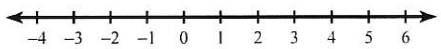
Solve each equation. (Khan Academy Video: Variables on both sides)

1) $\frac{14}{9} - n = \frac{4}{3}\left(\frac{1}{2}n + \frac{1}{3}\right)$

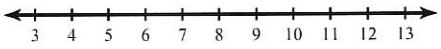
2) $-x - 4x = 3(6x + 1) - 3(1 + x)$

Solve each inequality and graph its solution. (Khan Academy Video: Two Step Inequality example)

3) $88 < 5(6 - 6b) - 2$



4) $6(8m + 8) \leq 336$



Solve each proportion. (Khan Academy Video: Proportions 2)

5) $\frac{10}{2x + 6} = \frac{9}{x + 11}$

6) $\frac{5a + 5}{11} = \frac{11a + 11}{6}$

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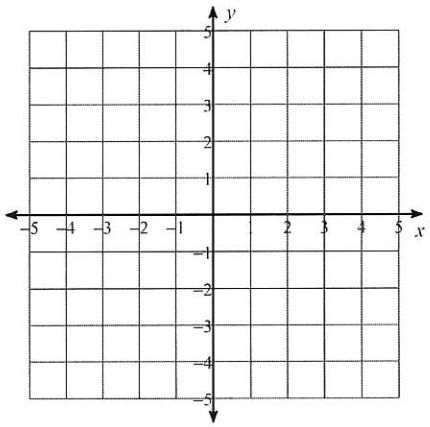
Solve each system by graphing. (Khan Academy Topic: Solving Linear Systems by Graphing)

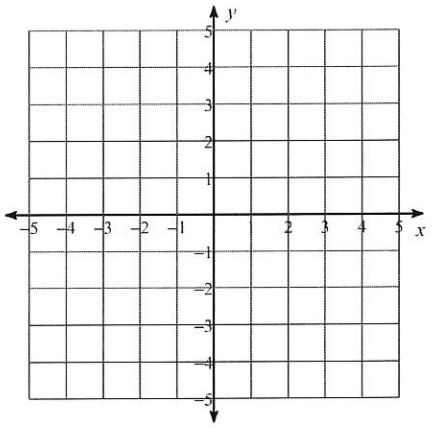
7) $y = \frac{2}{3}x - 1$

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



8) $-2y = 2 - x$

$0 = x + 6 + 2y$



Solve each system by substitution.(Khan Academy Topic: Solving Linear Systems by Substitution)

9) $4x + y = 4$

$-3x - 2y = 7$

10) $2x - 8y = 12$

$-3x - 2y = 24$

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Solve each system by elimination.(Khan Academy Topic: Solving Linear Systems by elimination and Solving Linear Systems by Multiplication)

11) $6x + 4y = 18$
$-6x - 3y = -18$

12) $3x - 2y = -11$
$5x - 3y = -20$

Simplify. Your answer should contain only positive exponents. (Khan Academy Topic: Exponent Properties - there are several videos on this topic which cover all properties)

13) $2x^2 \cdot (-3xy)^2$

14) $(3u^2v^3 \cdot u^3v^2)^2$

15) $\left(\frac{3x^2 \cdot 2x^2y^3}{x^2y^{-2}}\right)^0$

16) $\left(\frac{3yx^{-3}}{xy^2 \cdot 3x^3y^2}\right)^3$

Simplify.(Khan Academy Topic: Adding and simplifying radicals)

17) $\sqrt{32}$

18) $3\sqrt{80}$

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19) $\sqrt{512}$

20) $-6\sqrt{294}$

21) $-2\sqrt{5} - 2\sqrt{8} - 2\sqrt{20}$

22) $2\sqrt{20} + 2\sqrt{20} + 2\sqrt{5}$

23) $-2\sqrt{3} - \sqrt{20} + 2\sqrt{5}$

24) $\dfrac{\sqrt{10}}{\sqrt{45}}$

25) $\dfrac{\sqrt{10}}{5\sqrt{16}}$

26) $\dfrac{5\sqrt{20}}{4\sqrt{4}}$

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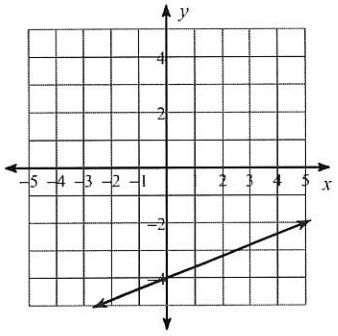
Write the slope-intercept form of the equation of each line given the information provided.(Khan Academy Topic:Constructing equations in slope intercept form - there are multiple videos on this topic, Also see equations of parallel and perpendicular lines)

27)



28) $4x + 3y = 22$

29) $y - 3 = 3(x - 4)$

30) Slope $= -\frac{1}{2}$, y-intercept $= -1$

31) through: $(3, -1)$, slope $= -\frac{2}{3}$

32) through: $(-5, 2)$ and $(4, -4)$

33) through: $(-1, 4)$, parallel to $y = -2x - 5$

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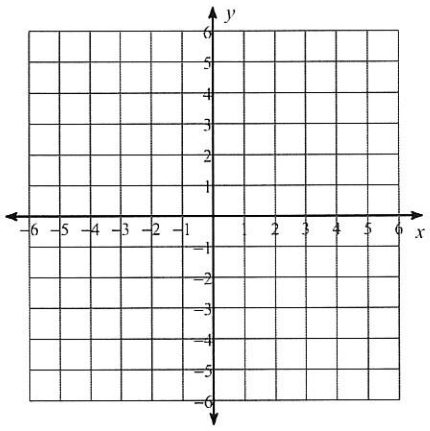
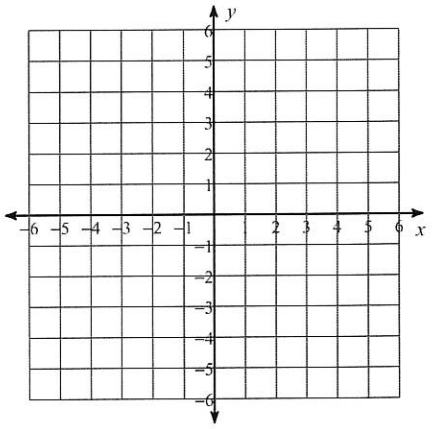
34) through: $(1, -1)$, perp. to $y = \frac{1}{4}x + 4$

Sketch the graph of each line. (Khan Academy Topic: Graphing linear equations in slope intercept form)

35) x-intercept = -1, y-intercept = 1



36) $4x - y = -3$



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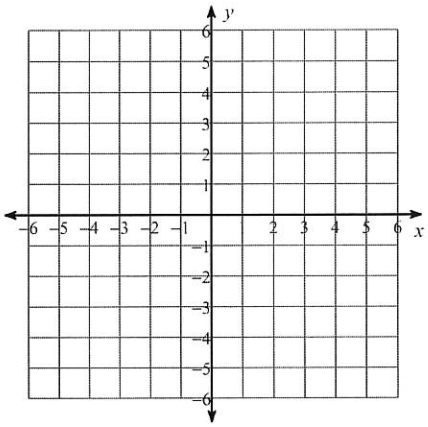
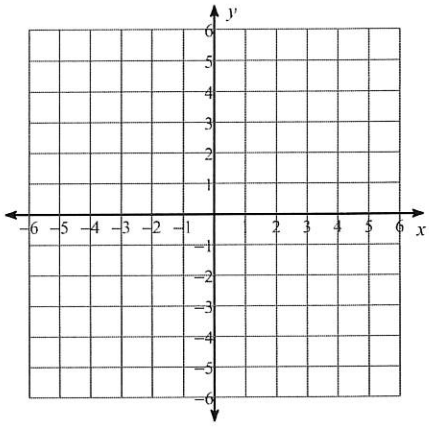
37) $y = -2x + 5$



38) $x = 4$



Simplify each expression. (Khan Academy Topic: Addition and subtraction of polynomials)

39) $-3(b - 3) + 3(4b + 3)$

40) $7(6r + 8) - 5(1 + 8r)$

Find each product. (Khan Academy Topic: Multiplying polynomials)

41) $(3x + 7)(6x + 3)$

42) $(4n - 7)(5n - 8)$

43) $(6m + 6n)(2m - 7n)$

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Factor each completely. (Khan Academy Topic: Factoring Quadratics)

44) $a^2 - 7a + 10$

45) $5x^2 + 100x + 500$

46) $4x^3 - 44x^2 + 112x$

47) $3a^3 - 27a$

Solve each equation by factoring. (Khan Academy Topic: Solving a quadratic equation by factoring)

48) $v^2 = 14 - 5v$

49) $x^2 = 9$

50) $x^2 = -24 - 11x$

51) $b^2 = 4b$

Evaluate each function. (Khan Academy Video: Evaluating with function notation)

52) $p(t) = 2t + 4$; Find $p(2)$

53) $p(n) = -n^2 + 5n$; Find $p(-3)$

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Evaluate each expression. (Khan Academy Video: Adding and subtracting fractions)

54) $1\frac{2}{3}+\left(-1\frac{6}{7}\right)+3+2$

55) $2\frac{1}{4}-\frac{1}{4}+\left(-2\frac{5}{6}\right)+3\frac{1}{4}$

Find each quotient. (Khan Academy Video: Multiplying and dividing fractions)

56) $\dfrac{3\frac{3}{4}}{\frac{4}{5}}$

57) $\dfrac{\frac{-2}{1}}{4}$

Evaluate each using the values given. (Khan Academy Video: Evaluating expressions in one variable)

58) $yx-x-\left(x^2+y\right)$; use $x=-3$, and $y=-13$

59) $(a+b)(c-b-|c|)$; use $a=24$, $b=-9$, and $c=3$

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