

# **Algebra 2-1**

## **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 in both Algebra 1 and Geometry.
- 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](http://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:**

- 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!**

## Algebra 2-1

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

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

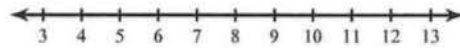
2)  $-x - 4x = 3(6x + 1) - 3(1 + x)$

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)

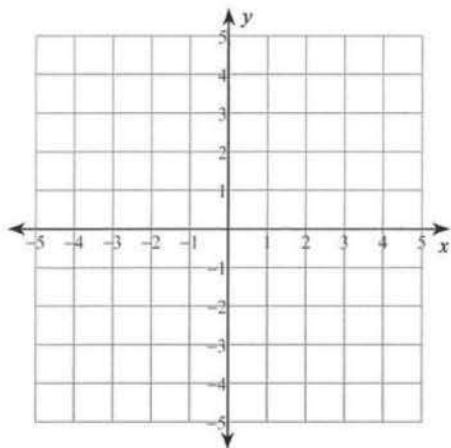
5)  $\frac{10}{2x+6} = \frac{9}{x+11}$

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

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

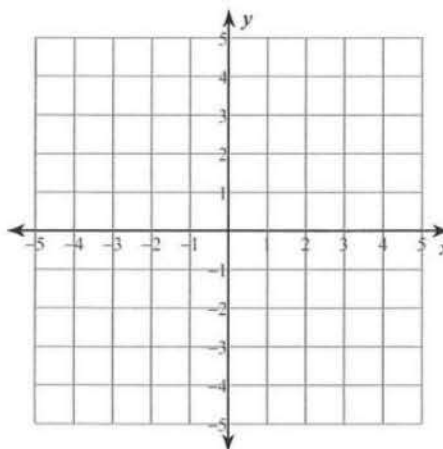
7)  $y = \frac{2}{3}x - 1$

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



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)  $2x - 8y = 12$

$-3x - 2y = 24$

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

$$11) \begin{cases} 6x + 4y = 18 \\ -6x - 3y = -18 \end{cases}$$

$$12) \begin{cases} 3x - 2y = -11 \\ 5x - 3y = -20 \end{cases}$$

**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)**

$$17) \sqrt{32}$$

$$18) 3\sqrt{80}$$

19)  $\sqrt{392a^3}$

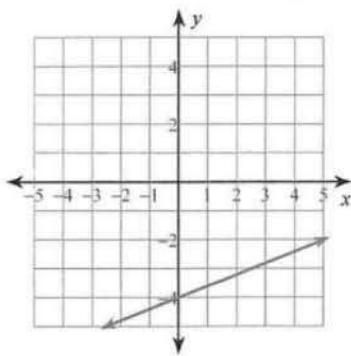
20)  $-\sqrt{180x^4}$

21)  $3\sqrt{2} + 3\sqrt{12} + 3\sqrt{12}$

22)  $\frac{\sqrt{6}}{2\sqrt{8}}$

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)

23)



24)  $4x + 3y = 22$

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

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

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

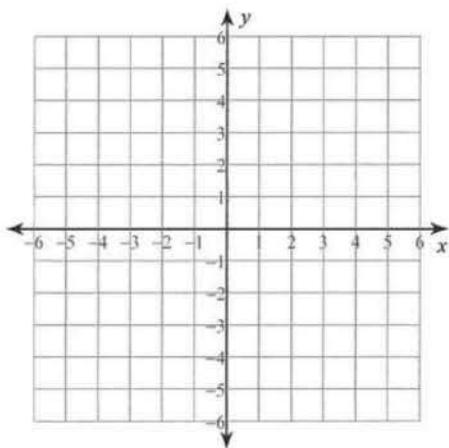
28) through:  $(-5, 2)$  and  $(4, -4)$

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

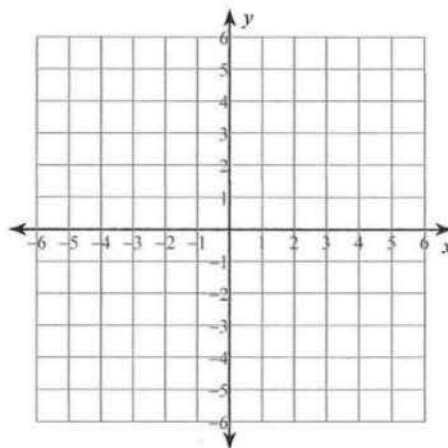
30) through:  $(1, -1)$ , perp. to  $y = \frac{1}{4}x + 4$

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

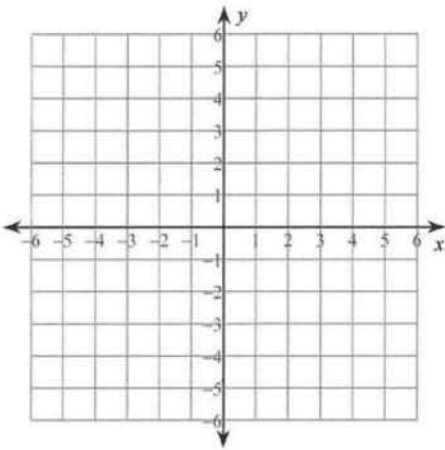
31)  $x$ -intercept  $= -1$ ,  $y$ -intercept  $= 1$



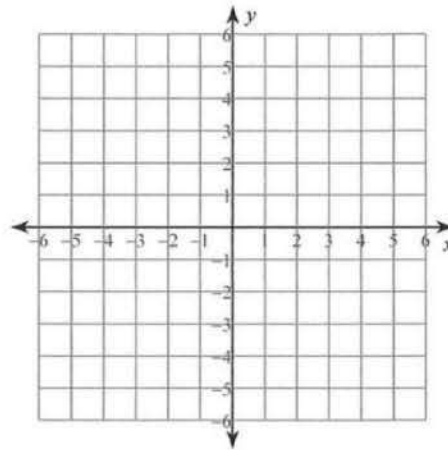
32)  $4x - y = -3$



33)  $y = -2x + 5$



34)  $x = 4$



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

35)  $-3(b - 3) + 3(4b + 3)$

36)  $7(6r + 8) - 5(1 + 8r)$

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

37)  $(3x + 7)(6x + 3)$

38)  $(4n - 7)(5n - 8)$

39)  $(6m + 6n)(2m - 7n)$

40)  $(8x + 2)(x^2 - 2x + 4)$

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

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

42)  $5x^2 + 100x + 500$

43)  $4x^3 - 44x^2 + 112x$

44)  $3a^3 - 27a$

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

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

46)  $x^2 = 9$

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

48)  $b^2 = 4b$



**Solve each equation by completing the square. (Khan Academy Topic: Solving quadratic equations by completing the square)**

49)  $n^2 + 18n - 37 = 7$

50)  $x^2 - 16x + 36 = -3$

**Solve each equation with the quadratic formula. (Khan Academy Topic: How to use the quadratic formula)**

51)  $8k^2 + 3k = 1$

52)  $3k^2 + k = 6$

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

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

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

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

55)  $1\frac{2}{3} + \left(-1\frac{6}{7}\right) + 3 + 2$

56)  $2\frac{1}{4} - \frac{1}{4} + \left(-2\frac{5}{6}\right) + 3\frac{1}{4}$

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

$$57) \frac{3\frac{3}{4}}{\frac{4}{5}}$$

$$58) \frac{-2}{\frac{1}{4}}$$

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

$$59) yx - x - (x^2 + y); \text{ use } x = -3, \text{ and } y = -13$$

$$60) (a + b)(c - b - |c|); \text{ use } a = 24, b = -9, \text{ and } c = 3$$

**Factor each completely. (Khan Academy Video: Solving quadratic equations by factoring)**

$$61) 32k^3 + 28k^2 + 8k + 7$$

$$62) 12a^3 + 42a^2 + 2a + 7$$

$$63) 25r^4 - 1$$

$$64) b^4 - 25$$

$$65) 4x^2 - 9$$

$$66) 9m^2 - 16$$

$$67) 4x^2 + 32x + 63$$

$$68) 32x^2 - 24x$$

$$69) 10p^2 - 33p - 28$$

$$70) 12x^2 - 86x + 144$$

$$71) 15xy + 42p + 30x + 21py$$

$$72) 484n^3 + 100n$$