

Name \_\_\_\_\_

Block \_\_\_\_\_

## **Advanced Algebra 2 - Summer Assignment (Algebra I Review) Required and Due the Day of the Test (end of the second week of school)**

Welcome to an exciting year of learning Advanced Algebra 2. ☺

Next year will be a stimulating and challenging year as you take Advanced Algebra 2. In order to help ensure that you are ready for success from the first day of class, the summer assignment will review important *Algebra 1* skills that are essential. This assignment should take students about three hours. The skills for review include:

### **The Basics**

- order of operations
- solve basic equations (to include fractions)
- literal equations
- solve absolute value equations
- solve and graph linear inequalities
- simplify, factor and solve polynomials
- exponent rules
- simplifying radicals

### **Linear Equations**

- determine slope (including slope with variables)
- writing equations of lines using two points, point and slope, or intercepts
- solve and graph systems of equations and inequalities

### **Review of Functions**

- function basics

Please complete the summer assignment so you may ask questions over any content. A non-calculator test over Algebra 1 material will take place during the second week of school. **It is important that you complete the assignment without the use of a calculator.**

**Also, please show all work neat and organized on separate paper. You will turn this assignment in the day of the test.**

### **No Work = No Credit**

If you are in need of assistance throughout the completion of the assignment, please visit the websites provided on the next page. The links offer tutorials over Algebra I skills.

We hope you have a great summer and look forward to seeing you in August!

*Regards,*

*CHS Advanced Alg 2 Team*



**Helpful websites:**

- khanacademy.org
- itutoring.com (username – carroll, password – dragons)
- youtube.com
- google.com
- mathtv.com

**Simplify using the order of operations. (TEKS A.5.A)**

1. $-[6^2 - 10(2 - 7 \div 10)]$	2. $7[5 \cdot 3^2 - 11 \cdot 4]$	3. Evaluate $-5^2$ and $(-5)^2$ . Explain why the answers are different.
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**Solve the following equations. (TEKS A.5.A)**

4. $3(x-2)+2x = -5(x-2) - 1$	5. $\frac{2x}{5} + \frac{3}{4} = 5 - \frac{4x}{5}$	6. $\frac{3}{4}x + 6 = x + 5$	7. $3 x + 4  = 18$
8. $ x - 2  = -5$	9. $\frac{6}{7}(4x+1) + 5x = 2(x-8) + 4$	10. $\frac{2}{3} + x = \frac{5}{2} - \frac{5}{6}x$	

**Solve for the indicated variable. (TEKS A.5.A)**

11. Solve for x: $5abx = 30ac^2$	12. Solve for r : $A = \pi r^2$	13. Solve for $b_1$ : $A = \frac{h(b_1 + b_2)}{2}$
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**Solve the following inequalities and graph the solution on a number line. (TEKS A.2.H & A.5.B)**

14. $7 - 4x \leq 31$	15. $\frac{2}{3}(5 + 2x) > -9 + \frac{1}{2}x$
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**(TEKS A.10.B)**

16. A rectangular pen has a length 3 feet greater than its width. If both dimensions are increased by 5 feet, which expression represents the final area?

- A.  $10x + 40$       B.  $13x + 40$       C.  $x^2 + 13x + 40$       D.  $x^2 + 10x + 40$

**Perform the indicated operation and state your answer in simplest form. (TEKS A.8.A, A.1A.A, A.10.B)**

17. $-5x(x^2 + 7x - 1)$	18. $(3x + 5y)(5x - 6y)$	19. $(a - 3b)^2$
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**Simplify the following. (TEKS 6.1.E)**

20. $\frac{8t^2 - 24t + 10}{4}$	21. $\frac{x^2 + 5x}{5}$
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**Factor the polynomials completely. Don't forget to factor out the GCF first! (TEKS A.8.A)**

22. $x^2 + 6x - 40$	23. $x^2 - 16$	24. $3x^2 - 6x$	25. $4x^2 - 100$
26. $x^3 + 6x^2 - 4x - 24$	27. $2x^2 + 8$	28. $3x^2 + 11x + 8$	29. $25t^4 - 100t^2$
30. $2x^2 - 5xy - 3y^2$	31. $6v^3 - 16v^2 + 21v - 56$		

**Solve by Factoring. (TEKS A.8.A, A.10.E)**

32. $x^2 - 36 = 0$	33. $x^2 - 6x = 0$	34. $5x^2 - 18x = -9$	35. $4x^2 - 4x + 1 = 0$
36. Which is a root of the function $x^2 - 11x + 30 = 0$ ? A. 3                  B. 6                  C. 10                  D. 11			
37. Which of the following is an x-intercept of $y = -8x^2 - 10x + 3$ ? A. 3                  B. $\frac{1}{4}$ C. $\frac{2}{3}$ D. $\frac{3}{2}$			
38. Which of the following statements best describes the solution(s) of $2x^2 + x = 18$ ? A. no real solution                  B. one negative solution C. one positive and one negative solution                  D. two positive solutions			

**Express your answer in simplified form with positive exponents. (TEKS A.11.A)**

39. $(3x^4y^2)^3$	40. $4x^3 - x^3$	41. $(4x^{-8})(4x^{-3})$	42. $\frac{10x^6}{-2x^{-2}}$
43. $\frac{20 \cdot 10^7}{5 \cdot 10^4}$	44. $\frac{6x^2y^{-3}z^3}{2x^{-2}z^{-4}}$	45. $\frac{4x^0y^{-2}z^3}{2x}$	

**Write the expression in simplest radical form. All variables represent positive numbers. (TEKS A.11.A)**

46. $\sqrt{700}$	47. $3\sqrt{7} \cdot 5\sqrt{14}$	48. $(\sqrt{7} + 4)(\sqrt{7} - 3)$	49. $\frac{24\sqrt{32}}{4\sqrt{2}}$
50. $\frac{\sqrt{5} + 4}{\sqrt{3}}$	51. $\sqrt{48} + 5\sqrt{3}$	52. $\sqrt{48x^5y^6}$	

**53. Use the linear equation  $3x + 4y = 12$  to answer the questions below. (TEKS A.2.B, A.2.C)**

a. What is the slope?	b. What is the y-intercept?	c. Determine its root.
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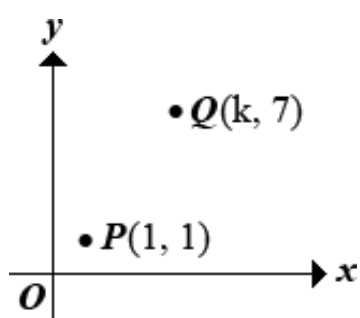
54. Lacey has to stuff 1000 letters into envelopes. She stuffs letters at a steady rate of 7 letters per minute. (TEKS A.2.B, A.2.C, A.3.A)

a. Define a variable for the time she has been stuffing, then write an expression for the number of letters remaining to be stuffed.	b. How many letters remain after 93 minutes?	c. About how long must Lacey stuff in order for only 400 letters to remain?
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55. A giraffe was 7 ft tall at age 4 and 11.5 ft tall at age 7. (TEKS A.2.B, A.2.C, A.3.A)

a. Using graph paper, create a graph reflecting this information. Assume the rate of growth was constant	b. Determine the rate of change (slope).	c. Determine the y-intercept.	d. Write the equation of the line in point-slope form.
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**Slope. (TEKS A.3.A, A.3.B)**

56. Determine the slope of the line between the points $(-2, 3)$ and $(-5, -10)$ .	57. If the slope of a line changes from $-4$ to $-1/4$ and the y-intercept changes from $-2$ to $0$ , then the graph of the line will be affected in what ways?  A. less steep, up 2 units B. less steep, down 2 units C. steeper, up 2 units D. steeper, down 2 units	58. In the figure, the slope through the points is $3/2$ . What is the value of $k$ ?  
59. Given $(m + 2, 4)$ and $(6, 3m)$ and the slope between the points is $4$ , what is the value of $m$ ?		

**Write the equation of each line in slope-intercept form. (TEKS A.2.B, A.2.C)**

60. slope of zero, passes through $(-8, 3)$	61. undefined slope, contains $(5, -6)$	62. passes through $(5, 2)$ and is perpendicular to $y = (4/7)x - 1$	63. passes through $(-8, 10)$ and is parallel to $y = (5/2)x - 3$
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**Write the equation of each line in standard form. (TEKS A.2.B, A.2.C, A.3.A)**

64. contains $(-8, 4)$ and the midpoint of the segment connecting $(-10, 5)$ and $(-5, 0)$	65. OMIT	66. x-intercept = $2$ , parallel to the line through $(6, 2)$ and $(2, -5)$	67. y-intercept = $-5$ , perpendicular to the line containing $(9, 8)$ and $(6, -1)$
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68. The following table gives value for the function  $f$  for several values of  $m$ . If the graph of  $f$  is a line, which of the following defines  $f(m)$ ? (TEKS A.4.C)

$m$	$f(m)$
-6	-5
-3	-4
0	-3
6	-1
9	0

- A.  $f(m) = 3m - 3$                       B.  $f(m) = 1/3 m - 3$   
 C.  $f(m) = 3m + 9$                       D.  $f(m) = 1/3m + 9$   
 E.  $f(m) = -3m + 31$

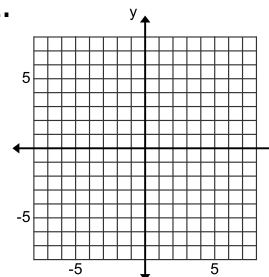
**Solve Systems of Equations and Inequalities**  
**(TEKS A.2.I, A.5.C, A.3.F)**

69. Given  $y = x - 3$  and  $4x + y = 32$ , solve for  $x$  and  $y$ .

70. Given  $5x + 2y = 24$  and  $4x + 3y = 29$ , what is  $2x - y$ ?

71. Five bags of fertilizer and six bags of peat cost a total of \$123. Three bags of fertilizer and three bags of peat cost a total of \$69. How much would it cost to purchase 2 bags of fertilizer and two bags of peat?

72.



In the  $(x, y)$  plane which of the following is/are true?

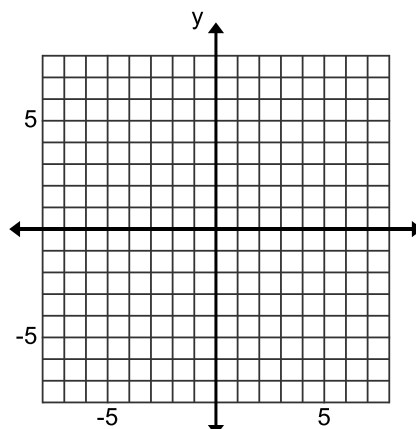
- I. Line  $y + x = 5$  is perpendicular to line  $y - x = 5$ .
- II. Lines  $y + x = 5$  and  $y - x = 5$  intersect each other on the  $y$ -axis.
- III. Lines  $y + x = 5$  and  $y - x = 5$  intersect each other on the  $x$ -axis.

- A. I only
- B. II only
- C. I and II
- D. I and III
- E. II and III

73. Graph the following. (TEKS A.3.H)

$$3x + 2y > -9$$

$$x - y \geq 2$$



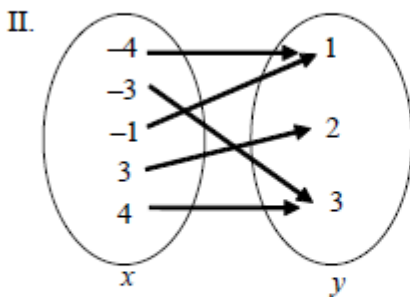
**Functions (TEKS A.2.A, A.6.C, A.7.A, A.7.B, A.12.A)**

74. The function  $h(t) = -16t^2 + 400$  can be used to study the relationship between the height,  $h(t)$ , of a falling object that is dropped from an altitude of 400 feet and the time,  $t$ , it takes to hit the ground. What is the independent variable for the function?

- A. height of object      B. speed      C. time      D. starting altitude

75. Which of the following represents a function?

I.  $\{(1,2), (3,-7), (0,6), (-4,4), (3,5)\}$



III.

$x$	2	3	7	10
$y$	6	9	6	9

- A. I only  
B. I and II only  
C. I and III only  
D. II and III only  
E. I, II, and III

76. Given  $f(x) = 3x + 4$ , determine  $f(2)$

77. Given  $f(x) = 3x + 4$ , if  $f(x) = 5$ , what is  $x$ ?

**Answers**

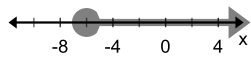
- 23
- 7
- Following the order of operations,  $-5^2 = -1 \cdot 5^2 = -25$ , but  $(-5)^2 = (-5)(-5) = 25$
- $x = 3/2$
- $x = 85/24$
- $x = 4$
- $x = \{-10, 2\}$
- No Solution or  $\emptyset$
- $x = -2$
- $x = 1$

11.  $\frac{6c^2}{b}$

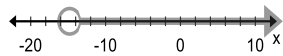
12.  $\frac{\sqrt{A\pi}}{\pi}$  (don't forget you have to rationalize the denominator)

13.  $\frac{2A}{h} - b_2$

14.  $x \geq -6$



15.  $x > -74/5$



16. C

17.  $-5x^3 - 35x^2 + 5x$

18.  $15x^2 + 7xy - 30y^2$

19.  $a^2 - 6ab + 9b^2$

20.  $2t^2 - 6t + 5/2$

21. already in simplest form or  $\frac{x^2}{5} + x$

22.  $(x + 10)(x - 4)$

23.  $(x - 4)(x + 4)$

24.  $3x(x - 2)$

25.  $4(x + 5)(x - 5)$

26.  $(x + 6)(x + 2)(x - 2)$

27.  $2(x^2 + 4)$

28.  $(3x + 8)(x + 1)$

29.  $25t^2(t + 2)(t - 2)$

30.  $(2x + y)(x - 3y)$

31.  $(3v - 8)(2v^2 + 7)$

32.  $x = \pm 6$

33.  $x = \{0, 6\}$

34.  $x = \{3/5, 3\}$

35.  $x = \{1/2\}$

36. B

37. B

38. C

39.  $27x^{12}y^6$

40.  $3x^3$

41.  $\frac{16}{x^{11}}$

42.  $-5x^8$

43.  $4 \cdot 10^3 = 4000$

44.  $\frac{3x^4z^7}{y^3}$

45.  $\frac{2z^3}{xy^2}$

46.  $10\sqrt{7}$

47.  $105\sqrt{2}$

48.  $-5 + \sqrt{7}$

49. 24

50.  $\frac{\sqrt{15} + 4\sqrt{3}}{3}$

51.  $9\sqrt{3}$

52.  $4x^2y^3\sqrt{3x}$

53a.  $-3/4$

b. (0,3)

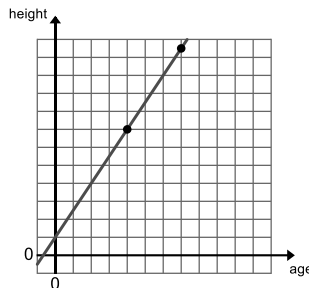
c. (4,0)

54. a) Let  $m$  = number of minutes;  $1000 - 7m$  = number of letters remaining

b)  $1000 - 7(93) = 349$ ; 349 letters

c) 85.7 minutes

55a.



b.  $3/2$

c. (0,1)

d.  $(y - 7) = \frac{3}{2}(x - 4)$

56.  $13/3$

57. A

58.  $k = 5$

59.  $m = 20/7$

60.  $y = 3$

61.  $x = 5$

62.  $y = (-7/4)x + 43/4$

63.  $y = (5/2)x + 30$

64.  $3x + y = -20$

65.  $44x + 56y = 95$

66.  $7x - 4y = 14$

67.  $x + 3y = -15$

68. B

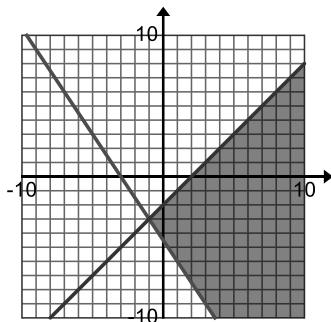
69. (7, 4)

70. If  $x = 2$  and  $y = 7$ , then  $2x - y = -3$

71. The total cost for two bags each of fertilizer and peat is \$46.00

72. C

73.



74. C



75. D

$$76. f(2) = 10$$

$$77. x = 1/3$$