

## Pre-AP Algebra II Summer Assignment

This summer assignment must be completed prior to the first day of school. You are responsible for all of this material upon your arrival to PreAP Algebra II. You will have a test over this material on the second day of class.

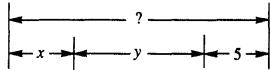
### I. Algebra Basics

Simplify using the order of operations.

1.  $-[6 - 10(2 - 7 \div 10)]$
2.  $3 + 6 \div 2 \cdot 3 - 36 \div 3^2$
3.  $4 + 2[3(7 - 6)]^3$

Write an expression for:

4. the seventh power of x.
5. four less than twice y.
6. seven more than the product of 6 and z.
7. 6 as a power with 2 as its base.
8. the sum of the squares of r and t.
9. the quotient of seven divided by the quantity six less than y.
10. the length marked “?”



### II. Terms and Properties

Explain the difference in meaning.

11. Evaluating an expression and solving an equation.
12.  $-5^2$  and  $(-5)^2$

State what property is illustrated.

13.  $(2x + 5)(4x + 1) = (5 + 2x)(4x + 1)$
14.  $\frac{x+y}{z} = \frac{x}{z} + \frac{y}{z}$
15. If  $5 = x$ , then  $x = 5$ .
16.  $2x + (x + 5) = (2x + x) + 5$

### III. Equations and Inequalities

Solve the equation or inequality. Graph each inequality on a number line.

17.  $3(x - 2) + 2x = 5(x - 2) - 1$
18.  $3(x + 2) - 1 = 5x + 5$

19.  $\frac{x}{x+1} = \frac{5}{7}$
20.  $\sqrt{2x+4} = x$
21. Solve for x:  $5abx = 30ac^2$
22.  $x^2 - 11x = 26$
23.  $3x + 13 > 100$
24.  $7 - 4x \leq 31$
25.  $4x + 3 < -3$  or  $4x + 3 \geq 15$
26.  $|x| > 3$

Solve each system of equations.

27.  $y = x - 3$   
 $4x + y = 32$
28.  $5x + 2y = 24$   
 $4x + 3y = 29$
29. For the two-variable equation  $3x + 4y = 12$ 
  - a. Transform it so that y is in terms of x.
  - b. Find y if x is 5.
  - c. What does the slope equal?
  - d. What does the y-intercept equal?
  - e. What does the x-intercept equal?

Write the equation of the line in all three forms (point-slope, slope-intercept, and standard).

30. slope =  $\frac{1}{5}$ , passes through (6, -7)
31. slope =  $\frac{1}{4}$ , passes through (1, -2)
32. x-intercept = 9, y-intercept = -4
33. horizontal, contains  $(-5\frac{3}{4}, 8)$
34. slope of zero, passes through (-8, 13)
35. undefined slope, contains (5, -6)
36. passes through (5, 2) and is perpendicular to  $y = \frac{4}{7}x - 1$
37. passes through (-8, 10) and is parallel to  $y = \frac{5}{2}x - 3$
38. contains (-8, 4) and the midpoint of the segment connecting (-10, 5) and (-5, 0)
39. the perpendicular bisector of the segment with endpoints  $(-\frac{5}{2}, -2)$  and (3, 5)
40. x-intercept = 2, parallel to the line through (6, 2) and (2, -5)
41. y-intercept = -5, perpendicular to the line containing (9, 8) and (6, -1)

#### IV. Polynomials

Transform the expression as indicated.

42. Distribute:  $5x(x^2 + 7x - 1)$
43. Multiply:  $(3x + 5y)(5x - 6y)$
44. Factor:  $x^2 - 5x + 6$
45. Factor:  $x^2 + 6x - 40$
46. Factor:  $x^2 - 16$

47. Square the Binomial:  $(x - 3.2)^2$ .
48. Factor:  $5x^2 - 16x + 3$ .
49. Simplify:  $4(x^2 - 2x + 6) - 3(x^2 + 4x - 5)$ .
50. Simplify:  $\frac{8t^2 - 24t + 12}{4}$ .
51. For the expression  $6x + 7$ :
- Name it by degree and by number of terms.
  - Evaluate it if  $x = -3$ .
  - Find  $x$  if the expression equals  $-35$ .
  - Find  $x$  if the expression equals  $9x - 4$ .
52. For the expression  $|3x - 5|$ :
- Evaluate it if  $x = 4$ .
  - Evaluate it if  $x = -5$ .
  - Find  $x$  if the expression equals  $13$ .
  - Find  $x$  if the expression equals  $-7$ .
53. For the expression  $3x^2 + 14x - 5$ :
- Name it by degree and by number of terms.
  - Evaluate it if  $x = -6$ .
  - Find  $x$  if the expression equals  $0$ .
  - Find  $x$  if the expression equals  $2$ .

Factor the polynomial completely.

54.  $3x^2 - 6x$
55.  $4x^2 - 100$
56.  $x^2(x - 3) - 16(x - 3)$
57.  $x^3 + 6x^2 - 4x - 24$
58.  $2x^2 + 8$
59.  $3x^2 + 11x + 8$
60.  $x^2 + 4x + 7$

Perform the indicated operation and state your answer in simplest form.

61.  $(a - 3b)^2$
62.  $(3x^4y^2)^3$
63.  $5x^2 + 2x^5$
64.  $4x^3 - x^3$
65.  $(4x^8)(4x^{-3})$
66.  $\frac{10x^6}{-2x^2}$
67.  $(8 \times 10^4)(4 \times 10^8)$
68.  $\frac{20 \bullet 10^7}{5 \bullet 10^4}$

## V. Radicals

69. For the expression  $\sqrt{2x-11}$
- Evaluate it if  $x$  is 1.
  - Evaluate it if  $x$  is 10.
  - Solve for  $x$  if the expression is equal to 9.

Write the expression in simplest radical form. Assume that variables stand for positive numbers.

70.  $\sqrt{700}$
71.  $3\sqrt{7} \cdot 5\sqrt{14}$
72.  $(\sqrt{7} + 4)(\sqrt{7} - 3)$
73.  $\frac{24\sqrt{32}}{4\sqrt{2}}$
74.  $\frac{\sqrt{5} + 4}{\sqrt{3}}$
75.  $\sqrt{48} + 5\sqrt{3}$
76.  $\sqrt{48x^5y^6}$
77.  $\frac{21x^3}{\sqrt{x^5}}$

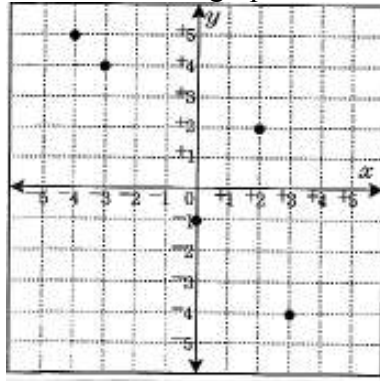
## VI. Word Problems

78. Lacey has to stuff 1000 letters into envelopes. She stuffs letters at a steady rate of 7 letters per minute.
- Define a variable for the time she has been stuffing, then write an expression for the number of letters remaining to be stuffed.
  - How many letters remain after 93 minutes?
  - About how long must Lacey stuff in order for only 400 letters to remain?
79. A pilot on a commercial airline makes \$100 per hour, and a copilot makes \$70 per hour. On a particular flight the copilot arrived early to check out the airplane. Let  $x$  be the number of hours the copilot has been on the job.
- Write the definition of  $x$ . Then write an expression for the number of dollars the copilot earned in  $x$  hours.
  - The pilot starts to work 3 hours after the copilot. Write an expression in terms of  $x$  for the number of hours the pilot has been on the job, and another expression for the number of dollars the pilot has earned.
  - Write an equation stating that each has earned the same number of dollars. How many hours has the copilot been on the job when this occurs?

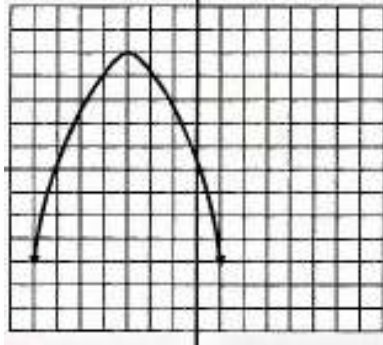
- d. How much money, total, will they earn if they both finish work after the copilot has been on the job for 12 hours?
80. A dolphin jumps out of the water with an initial upward velocity of 13 meters per second. The distance above the surface is given by  $d = vt - 5t^2$ .
- How high will the dolphin be after 0.7 seconds?
  - When will the dolphin be 3 meters above the surface, going up?
  - Will the dolphin ever be 10 meters above the surface? Justify your answer.
81. 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 does each bag of fertilizer and each bag of peat cost?
82. Two integers are in the ratio 4:5. The sum of the integers is 3159. Find the integers.

## VII. Graphing

83. What is the domain of the graphed relation?



84. State the domain and the range of the function shown in the graph.

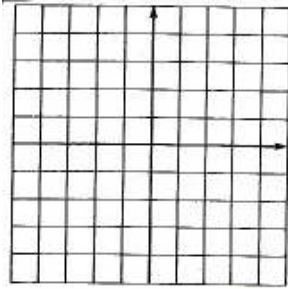


Graph each of the following.

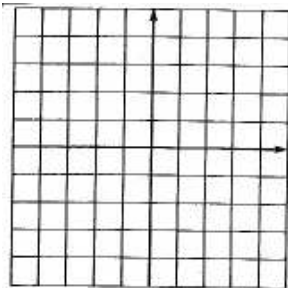
85.  $2x - 6y = -12$

86.  $2x + 3y = 12$

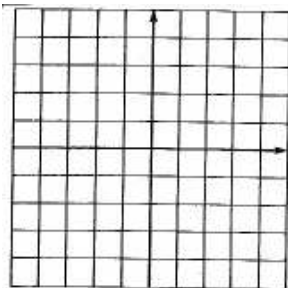
Graph for 85 & 86



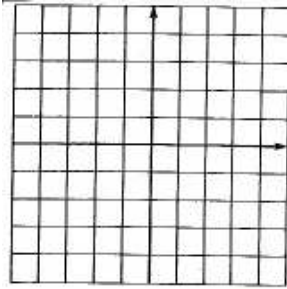
87.  $4y + x > -24$



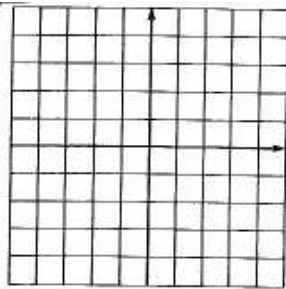
88.  $y \leq -\frac{4}{7}x - 4$



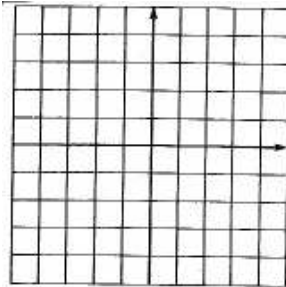
89.  $x + y = -1$   
 $3x - 4y = 4$



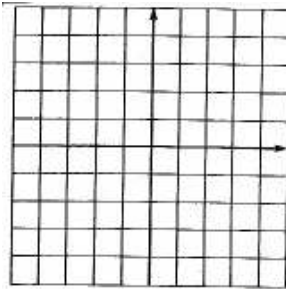
90.  $4x + 3y = -5$   
 $4x - 3y = 13$



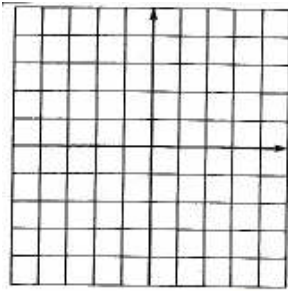
91.  $3x + 2y \geq -9$   
 $x - y \geq 2$



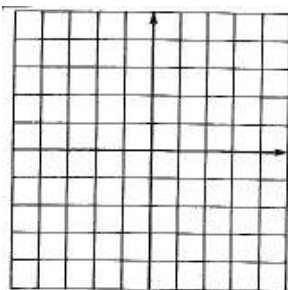
92.  $x + 4y < 6$   
 $x - y \leq 1$



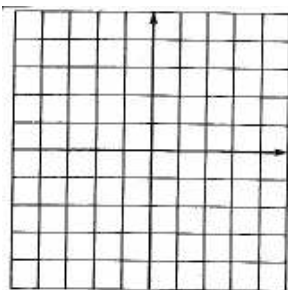
93.  $y = x^2 + 2$



94.  $y = -x^2 - 1$

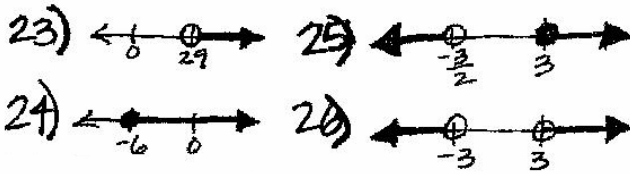


95.  $y = \frac{1}{2}x^2 + 2$



## Solutions to Honors Algebra II Summer Assignment

1. 7
2. 8
3. 58
4.  $x^7$
5.  $2y - 4$
6.  $6z + 7$
7.  $2^6$
8.  $r^2 + t^2$
9.  $\frac{7}{y-6}$
10.  $x + y + 5$
11. When evaluating, you **know** the value of the variable. When solving, you are **finding** the value of the variable.
12. -25; 25
13. Commutative of Addition
14. Distributive of Division over Addition
15. Symmetric Property of Equality
16. Associative of Addition
17. No Solution
18.  $\{0\}$
19.  $\left\{\frac{5}{2}\right\}$
20.  $\{8\}$ ; note: -2 is extraneous
21.  $x = \frac{6c^2}{b}$
22.  $\{13, -2\}$
23.  $x > 29$
24.  $x \geq -6$
25.  $x < -3/2$  or  $x \geq 3$
26.  $x > 3$  or  $x < -3$



27. (7, 4)
28. (2, 7)
29. a)  $y = -3/4x + 3$   
 b)  $y = -3/4$   
 c)  $-3/4$   
 d) 12  
 e) 4

30.  $y + 7 = 1/5(x - 6)$ ;  $y = 1/5x - 41/5$ ;  $x - 5y = 41$
31.  $y + 2 = 1/4(x - 1)$ ;  $y = 1/4x - 9/4$ ;  $x - 4y = 9$
32.  $y - 0 = 4/9(x - 9)$  or  $y + 4 = 4/9(x - 0)$ ;  $y = 4/9x - 4$ ;  $4x - 9y = 36$
33.  $y = 8$
34.  $y = 13$
35.  $x = 5$
36.  $y - 2 = -7/4(x - 5)$ ;  $y = -7/4x + 43/4$ ;  $7x + 4y = 43$
37.  $y - 10 = 5/2(x + 8)$ ;  $y = 5/2x + 30$ ;  $5x - 2y = -60$
38.  $y - 4 = -3(x + 8)$ ;  $y = -3x - 20$ ;  $3x + y = -20$
39.  $y - 3/2 = -11/14(x - 1/4)$ ;  $y = -11/14x + 95/56$ ;  $44x + 56y = 95$
40.  $y = 7/4(x - 2)$ ;  $y = 7/4x - 7/2$ ;  $7x - 4y = 14$
41.  $y + 5 = -1/3(x - 0)$ ;  $y = -1/3x - 5$ ;  $x + 3y = -15$
42.  $5x^3 + 35x^2 - 5x$
43.  $15x^2 + 7xy - 30y^2$
44.  $(x - 2)(x - 3)$
45.  $(x + 10)(x - 4)$
46.  $(x + 4)(x - 4)$
47.  $x^2 - 6.4x + 10.24$
48.  $(5x - 1)(x - 3)$
49.  $x^2 - 20x + 39$
50.  $2t^2 - 6t + 3$
51. a) linear binomial  
 b) -11  
 c) -7  
 d)  $11/3$
52. a) 7  
 b) 20  
 c) 6 or  $-8/3$   
 d) No values
53. a) quadratic trinomial  
 b) 19  
 c)  $1/3$  or -5  
 d) Approximately .46 or -5.12
54.  $3x(x - 2)$
55.  $4(x + 5)(x - 5)$
56.  $(x - 3)(x - 4)(x + 4)$
57.  $(x + 6)(x + 2)(x - 2)$
58.  $2(x^2 + 4)$
59.  $(3x + 8)(x + 1)$
60. prime
61.  $a^2 - 6ab + 9b^2$
62.  $27x^{12}y^6$
63. already in simplest form
64.  $3x^3$
65.  $16x^5$
66.  $-5x^4$

67.  $3.2 \times 10^{13}$

68.  $4 \times 10^3$

69. a)  $\sqrt{-9}$  not real

b) 3

c) 46

70.  $10\sqrt{7}$

71.  $105\sqrt{2}$

72.  $\sqrt{7} - 5$

73. 24

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

75.  $9\sqrt{3}$

76.  $4x^2y^3\sqrt{3x}$

77.  $12\sqrt{x}$

78. a) Let  $x$  = number of minutes;  $1000 - 7x$  = number of letters left

b)  $100 - 7(93) = 349$ ; 349 letters

c) 85.7 minutes

79. a)  $70x$  = number of \$ for pilot

b)  $x - 3$  = hours for pilot;  $100(x - 3)$  = \$ earned

c) 10 hours

d) \$1740

80. a) 6.65 m

b) .26 seconds

c) never reaches 10 m

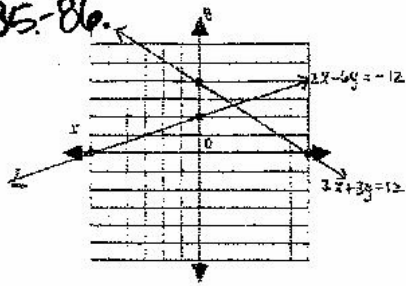
81. fertilizer = \$15 per bag; peat = \$8 per bag

82. 1404 and 1755

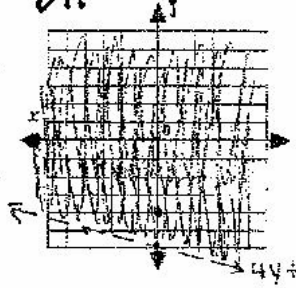
83.  $\{-4, -3, 0, 2, 3\}$

84. Domain:  $\{\text{all real numbers}\}$ ; Range:  $\{y \leq 5\}$

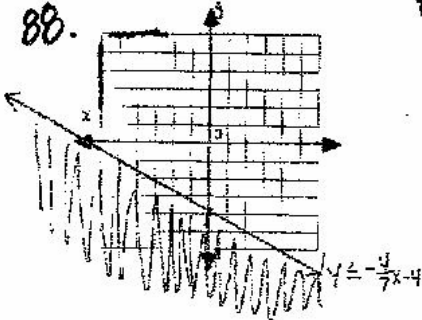
85-86.



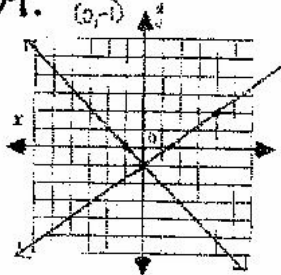
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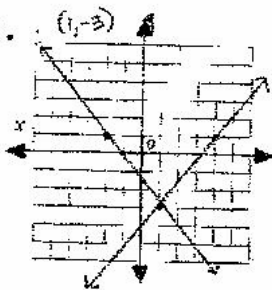
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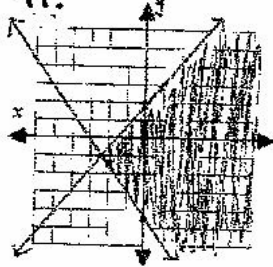
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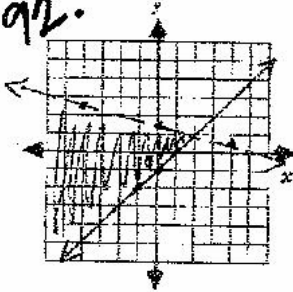
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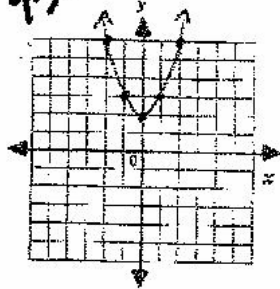
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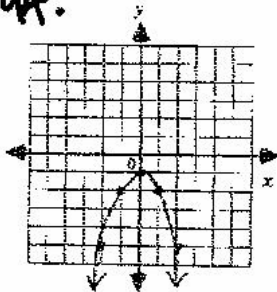
92.



93.



94.



95.

