BLUE KNIGHTS

Southington High School

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Dear Students,

Enclosed you will find a comprehensive set of problems which reflect critical math skills that must be mastered prior to entering your Algebra II class at Southington High School. You are encouraged to develop a wide range of ways for finding the correct answer, including techniques both with and without the aid of a calculator*. Working with a friend, sibling, or parent might be a helpful way to complete this assignment!

On the second day of school, your teachers will check your packets for completion and count it as your first three homework grades. In order to receive full credit for the assignment, you must attempt each problem and show all work used to complete it. The answers are provided as a means to assess your own work. During the first few days of school, your teachers will provide you with an opportunity to review your work from this packet. Soon thereafter, you will be given your first quiz that addresses these skills.

Our goal is for you to have a successful and enjoyable transition into your Algebra II class at Southington High School. This packet is meant to facilitate this process. Try your best and remember your teachers will help you upon your return.

Sincerely,

David Kowalchuk
Mathematics Department Chair
Southington High School
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Distance Learning # (401) 315-8897

Frank Pepe
Principal

*Reminder: A graphing calculator is an important tool used within this course. Students are strongly encouraged to obtain one for their personal use. Copies of this packet may be found on the Southington High School Website. Go to www.southingtonschools.org and click on the link to Parent Resources

Name: _____ Date: _____

SUMMER ALGEBRA II PACKET 2020

Find the sum, difference, product, or quotient of the integers (No Calculator):

1) 26 + -13 = 2) -9 – 5 = 3) 32 – (-7) = 4) -9 + (-41) =

5) 8 · -5 = 6) -63/7 = 7) 68/-4 = 8) (-15)(-6) =

Order of Operations (No Calculator): **P E M D A S** –**P**arentheses, **E**xponents, **M**ultiply or **D**ivide, **A**dd or **S**ubtract

9) [15 – 3(26 – 20) + 25 ÷ 5 * 11] =

10) $6^2 - 4(7^2 - 32 \div 4 * 3) =$

11) $\{10 - 5[20 - 2(3^2 + 1)]\} =$

12) $\frac{48-24\div 2^3}{3+2*6} =$

13) $(16 * 5 \div 10 + 2)(2^5 - 6^2 \div 4) =$

Use the Distributive Property to simplify each expression:

14) 5(x + 12) =

15) x(x – 7) =

16) 3x(x – 11) =

17) $-\frac{2}{3}(3x - 6) =$

Multiply the expression:

18) (x – 7) (x + 7)

19) – (y + 6) (y + 1)

20) $(x + 4)^2$

21) $(2x - 4)(3x^2 + 5x - 8)$

Simplify each expression by combining like terms:

22) $7y + y + 2y$

23) $12m – m – 3n + 14n$

24) $-8b + 5a – 7b – 12a$

25) $9x^2 + 7x – 15 – 13x + 17 – 6x^2$

Solve the following equations:

26) $48x + 32 = 24$

27) $-3y + 15 = -12$

28) $8(d – 10) = 32$

29) $14m + 76 = -10m – 32$

30) $48c + 25 = 12c - 11$

31) $8(2p – 5) = -6(3p - 4)$

32) $–y – 2 = 9(y – 8)$

33) $\frac{5}{4}x + 25 = -20$

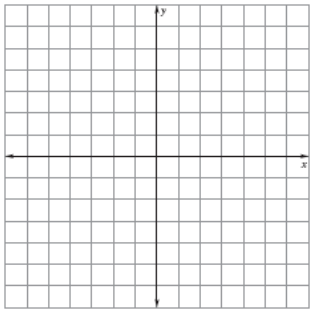
Solve each inequality and graph on a number line:

34) $4x – 14 \geq -26$

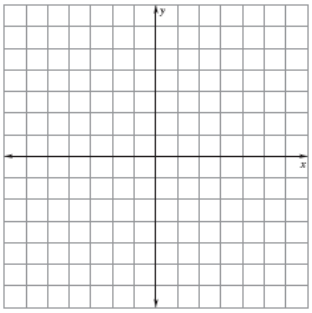
35) $12 – 3x \geq 33$

Graph the solutions on the coordinate planes:

36) $4x + 2y < 8$

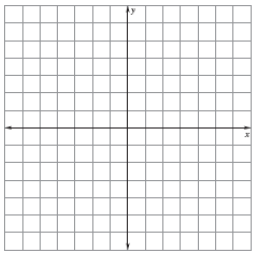


37) $x + 2y \geq 1$

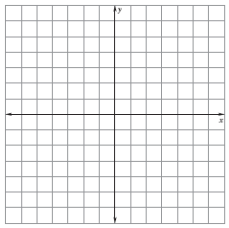


Graph the solutions on the coordinate planes:

38) $x < -7$



39) $y \geq 3$



Find the slope and y-intercept for each equation:

40) $y = 3x + 4$

41) $2y = 2x + 10$

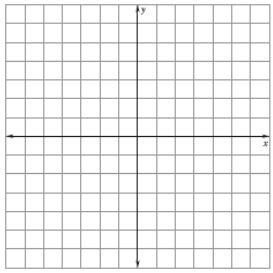
Find the x-intercept and y-intercept for each equation:

42) $4y = 12x - 6$

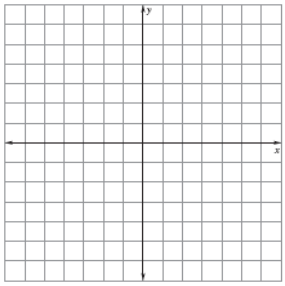
43) $5x - 4y = 8$

Graph number 41 and 43, using the information found from each problem:

44)



45)



Find the equation of the line, in slope-intercept form, given the following:

46) slope = 3/2 and y-int. (0, 5)

47) Points A(3, 4) B(-1, 8)

Solve each system of equations:

48) $y = 3x - 9$
$y = -x - 1$

49) $2x + 5y = 1$
$x - y = -3$

50) $x + 3y = 7$
$x = 2y + 2$

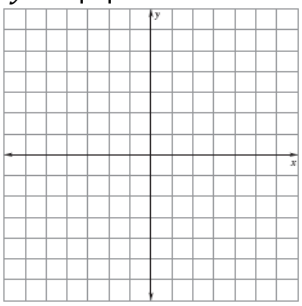
51) $3x + y = 12$
$-2x + 3y = -8$

52) $x + 2y = 5$
$x + 2y = 7$

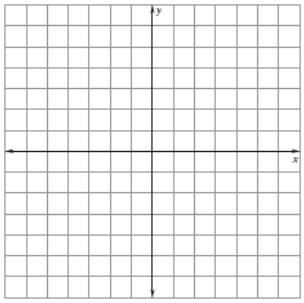
53) $y = x + 4$
$3x - 3y = -12$

Graph each of the following:

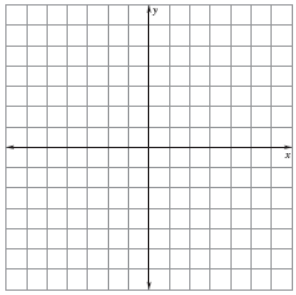
54) $y = |x| - 2$



55) $y = |x - 4|$



56) $y = -|x - 1|$



Simplify each expression using the properties of exponents:

57) $x^4 \cdot x^5$

58) $(3x)^0$

59) $3x^0$

60) 4^{-3}

61) $(-3x^2 y^4)^3$

62) $(5m^2 n)(6m^3 n^2)^2$

63) $\frac{x^{12}}{x^4}$

64) $\left(\frac{y^4}{x^8}\right)^3$

65) $\frac{a^5 \cdot a^8}{a^6}$

66) $(2xy)^3$

67) $(-4x^2 y^4)^2$

68) $\frac{a^5 b^5 \cdot a^8 c}{a^6 b^8 c}$

Find the sum and difference for the following:

69) $(2x^2 - 4x + 3) + (x^3 - 5x + 1)$

70) $(34x^2 + 2x + 4) - (4x^2 - 2x + 2)$

Factor the following expressions, completely:

71) $x^2 + 8x + 15$

72) $x^2 - 3x - 18$

73) $2x^2 + 4x - 48$

74) $x^2 - 13x + 36$

75) $3x^2 - 11x - 20$

76) $16x^2 - 25$

77) $3x^2 - 9x - 30$

78) $6x^2 + 45x$

Solve the following equations:

79) $(x - 8)(x + 3) = 0$

80) $x^2 – 2x – 35=0$

81) $x^2 + 5x = – 6$

82) $0 = 6x^2 – 7x – 5$

83) $x^2 – 121=0$

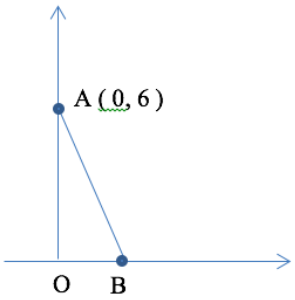
84) $2x^2 – 8x = 0$

85) Which of the following expressions must be positive for all values of *n* ?

(A) $n^2 + n$
(B) n^3
(C) $n^3 + n$
(D) $n^3 + n^2$
(E) $n^4 + n^2 + 1$

86) In the following figure, if the slope of line AB is $-\frac{3}{2}$, what is the area of triangle AOB?

(A) 24 units^2
(B) 18 units^2
(C) 16 units^2
(D) 14 units^2
(E) 12 units^2



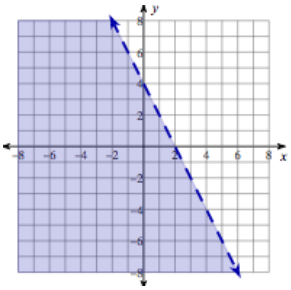
87) If $x^2 – y^2 = 77$ and $x + y = 11$, what is the value of x?

ANSWER KEY

1. 13
2. -14
3. 39
4. -50
5. -40
6. -9
7. -17
8. 90
9. 52
10. -64
11. 10
12. 3
13. 230
14. 5x + 60
15. $x^2 - 7x$
16. $3x^2 - 33x$
17. -2x + 4
18. $x^2 - 49$
19. $-y^2 - 7y - 6$
20. $x^2 + 8x + 16$
21. $6x^3 - 2x^2 - 36x + 32$
22. 10y
23. 11m + 11n
24. -7a –15b
25. $3x^2 - 6x + 2$
26. x = -1/6
27. y = 9
28. d = 14
29. m = -4.5
30. c = -1
31. p = 1.9 or $\frac{32}{17}$
32. y = 7
33. x = -36
34. $x \geq -3$

35. $x \leq -7$

36.



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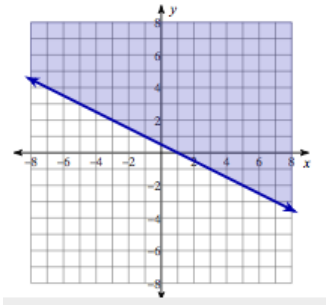

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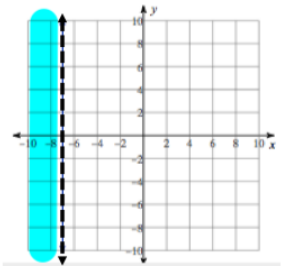

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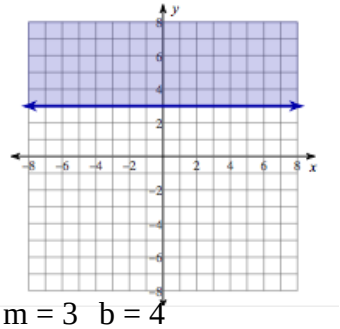
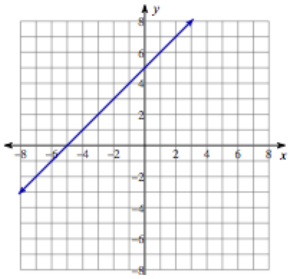


40. m = 3 b = 4
41. m = 1 b = 5
42. x-int. : (.5,0) ; y-int.: (0,-1.5)
43. x-int. : (1.6,0) ; y-int.: (0,-2)
44.



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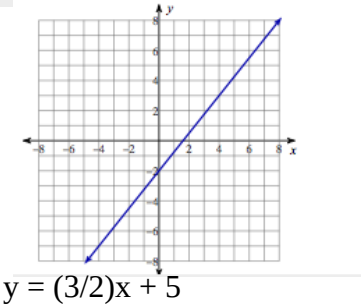
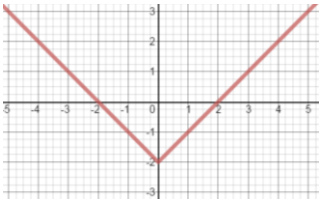
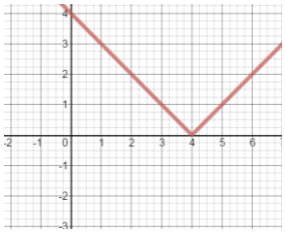
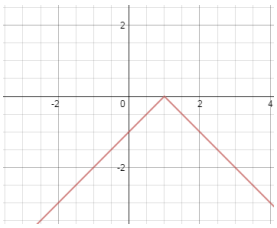


46. y = (3/2)x + 5
47. y = -x + 7
48. (2,-3)

49. (-2,1)
50. (4,1)
51. (4,0)
52. No Solution
53. Infinite Solutions
54. 
55. 
56. 
57. x^9
58. 1
59. 3
60. 1/64
61. $-27x^6y^{12}$
62. $180m^8n^5$
63. x^8
64. $\frac{y^{12}}{x^{24}}$
65. a^7
66. $8x^3y^3$
67. $16x^4y^8$
68. $\frac{a^7}{b^3}$
69. $x^3 + 2x^2 – 9x + 4$
70. $30x^2 + 4x + 2$
71. $(x + 5)(x + 3)$
72. $(x – 6)(x + 3)$
73. $2(x + 6)(x – 4)$
74. $(x – 9)(x – 4)$
75. $(3x + 4)(x – 5)$
76. $(4x + 5)(4x – 5)$
77. $3(x + 2)(x – 5)$
78. $3x(2x + 15)$
79. x = -3,8
80. x=-5,7
81. x=-3,-2
82. x=-1/2, 5/3
83. x =-11,11
84. x=0,4
85. E
86. E
87. x = 9