For incoming students to Integrated Math 3 and Transition to College Math

Cover Page - Please Read!!

The intent of this packet is to review key concepts from last year's math class so you return to school in the Fall with minimal skill loss. This packet is due the first day back in school in the fall. You will be uploading these pages onto Canvas. It will be graded. You need to get off to a good start so spend some quality time on this packet this summer.

Please write the answers to each problem in the space provided in this packet. You may include your work on this paper or on separate pieces of papers. If you are including your work on this paper, please be neat and box your final answers, so we don't have to hunt them down!

Please use the suggested website or others of your own choosing to solve these problems. Don't fake your way through these problems. Faking through these problems won't help set you in the right path for your next math class. You need to get off to a good start so spend some quality time on this packet this summer. You want these techniques to be relatively fresh in your mind in the fall, so begin working on this packet about four weeks before the start of school. Do not wait to do them at the very last minute. These take time.

Here is a good site for most algebra topics: http://www.purplemath.com/modules/index.htm

Topic 1 - Number Sense
Topic 2 - Algebra Foundations
Topic 3 - Solving Linear Equations
Topic 4 - Graphing Linear Functions
Topic 5 - Writing Equations of Straight Lines
Topic 6 - Factoring
Topic 7 - Graphing Quadratic Functions
Topic 8 - Solving Quadratic Equations
Topic 9 - Simplifying Complex Numbers
Topic 10 - Simplifying Square Roots

Topic 1: Number Sense
Please complete this section without using a calculator

1. Add.
   $34 + (-21)$

2. Subtract.
   $-5 - (-8)$

3. Multiply.
   $-8 \cdot 9$

4. Divide.
   $-48 \div 8$

5. $\frac{7}{13} + \frac{16}{13} - \frac{8}{13}$

6. $\frac{1}{4} + \frac{5}{6} + \frac{3}{8}$

7. $4\frac{7}{8} + \left(-9\frac{1}{2}\right)$

8. Divide.

   $6\frac{2}{7} \div \frac{3}{4}$

9. Divide.

   $4\frac{2}{3} \div \frac{1}{6}$

10. Simplify 9^3.

11. Simplify -3^4.

12. Simplify $(-4)^2$.

13. Simplify $\left(\frac{5}{6}\right)^2$.

14. Simplify $20 + 3[5 - (2)^6]$.

15. Simplify $3^4 + 12 \div 3 - (1 - 9)$.

16. Simplify the expression $\frac{2 + 4^2}{2} + |1 - 6|$.

17. Simplify the expression $\frac{2 + 2^2}{2} + |13 - 19|$.

Topic 2: Algebra Foundations

18. Simplify by combining like terms.
$3x^3 + 9z + 2x^3 + 5z + 6x^2$

19. Simplify by combining like terms.
$9a^3 + 5t - 2a^3 - 3t - 8a^2$

20. Simplify the expression $x^2 + 8x + 8y - 7x^2$.

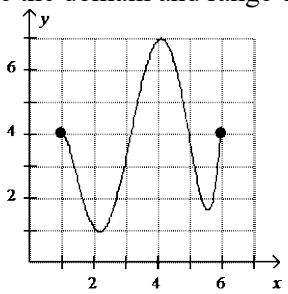
21. Simplify the expression $s^2 - 3s + t + 5s^2$.

22. Graph the point (1, 4).

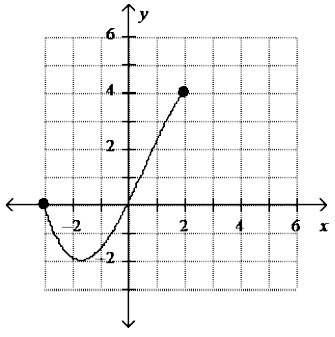
23. Give the domain and range of the relation.

x	*y*
5	11
6	13
0	0
–8	–15

24. Give the domain and range of the relation.



25. Give the domain and range of the relation.



26. For $f(x) = -4x + 2$, find $f(x)$ when $x = -1$.

27. For $f(x) = -7x - 14$, find $f(x)$ when $x = -3$.

28. For $f(x) = -5x - 2$, evaluate $f(5)$.

Topic 3: Solving Equations

29. Solve $-14 + s = 32$.

30. Solve $3n = 42$.

31. Solve $\frac{2}{10}b = 99$.

32. Solve $\frac{f}{45} - \frac{2}{9} = \frac{2}{9}$.

33. Solve $\frac{f}{90} - \frac{1}{6} = \frac{3}{6}$.

34. Solve $43a + 10 - 26a = 27$.

35. If $8y - 8 = 24$, find the value of $2y$.

36. Solve $50q - 43 = 52q - 81$.

37. Solve $n - 8 + n = 1 - 4n$.

38. Solve the proportion $\frac{5}{6} = \frac{x}{30}$.

39. Solve the proportion $\frac{1}{8} = \frac{x}{56}$.

40. Solve $-6m - 6 + 8m = -5 + 2m - 1$. Tell whether the equation has infinitely many solutions or no solutions.

41. Solve $3n - 24 = 14 - 30n$.

42. Solve $-4(24 + 8y) = -64$.

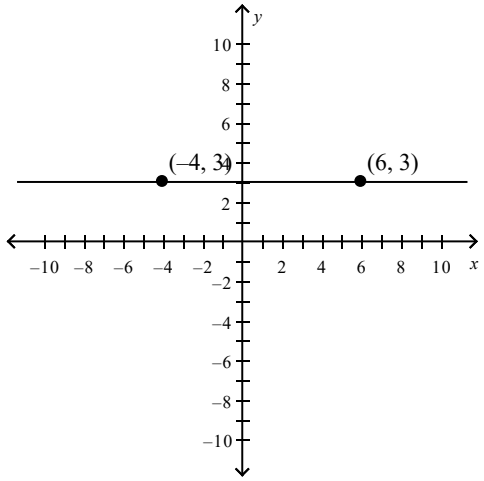
Topic 4: Graphing Linear Functions

43. Graph $-4x + 7y = -28$.

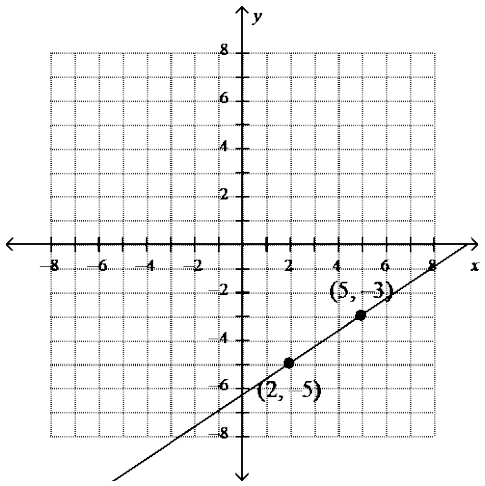
44. Graph the line that goes through point (–5, 5) with slope $\frac{1}{5}$.

45. Graph the function $y = 2x - 1$.

46. Find the slope of the line.



47. Find the slope of the line.



48. Find the slope of the line that contains $(1, 6)$ and $(10, -9)$.

49. Find the slope of the line described by $x - 3y = -6$.

50. Graph the line with the slope $\frac{1}{3}$ and y-intercept –2.

51. Graph the line with a slope of $\frac{2}{3}$ that contains the point (3, –7).

Topic 5: Writing Equations of Straight Lines

52. Write an equation in point-slope form, $y - y_1 = m(x - x_1)$, of the line through points (4, –4) and (1, 2) Use (4, –4) as the point (x_1, y_1).

53. Write an equation for the horizontal line that contains point $E(-3, -1)$.

54. Write an equation in slope-intercept form of the line through points $S(-10, -3)$ and $T(-1, 1)$.

55. Is the line through points $P(0, 5)$ and $Q(-1, 8)$ parallel to the line through points $R(3, 3)$ and $S(5, -1)$? Explain.

56. Write an equation for the line parallel to $y = -7x + 15$ that contains $P(9, -6)$.

57. Is the line through points $P(0, -9)$ and $Q(2, -8)$ perpendicular to the line through points $R(1, 4)$ and $S(3, 3)$? Explain.

58. Write the equation that describes the line with slope = 2 and y-intercept = $\frac{3}{2}$ in slope-intercept form.

59. Write the equation that describes the line in slope-intercept form.
slope = 4, point (3, –2) is on the line

60. Write an equation in point-slope form for the line that has a slope of 6 and contains the point (–8, –7).

61. Write an equation in slope-intercept form for the line that passes through (3, 7) and (7, 4).

62. Write an equation for the line perpendicular to $y = 2x - 5$ that contains (–9, 6).

Topic 6 - Factor completely.

63. $-15x^2 - 21x$

64. $-21x^2 - 6x$

65. $8x^2 + 12x - 16$

66. $x^2 + 14x + 48$

67. $x^2 - 2x - 63$

68. $3x^2 + 26x + 35$

69. $5x^2 - 22x - 15$

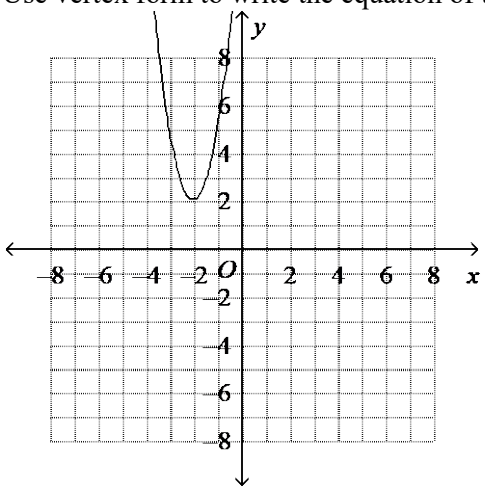
70. $16x^2 + 40x + 25$

71. $9x^2 - 16$

72. $4x^2 - 49$

Topic 7 - Graphing The Quadratic Function

73. Use vertex form to write the equation of the parabola.



74. Identify the vertex and the *y*-intercept of the graph of the function $y = -3(x + 2)^2 + 5$.

75. Write the equation of the parabola in vertex form.
vertex (–4, 3), point (4, 131)

76. Write $y = 2x^2 + 12x + 14$ in vertex form.

77. Sketch the graph of $y = -2(x - 2)^2 - 4$ by identifying the vertex and several points on the graph.

Topic 8 - Solving Quadratic Equations

Solve by factoring, the quadratic formula, taking the square roots or completing the square. Give exact, simplified answers.

78. $4x^2 + 28x - 32 = 0$

79. $108x^2 = 147$

80. $3x^2 = 21$

81. $9x^2 + 16 = 0$

82. $x^2 + 18x + 81 = 25$

83. $x^2 + 10x + 14 = 0$

84. $x^2 + 10x + 35 = 0$

85. $-3x^2 + 7x = -5$

86. $5x^2 + 9x - 2 = 0$

87. $4x^2 - x + 3 = 0$

88. $-2x^2 + x + 8 = 0$

Topic 9 - Complex Numbers
Simplify each expression. Express answers in the form a + b*i*

89. Write the number in the form a + bi. $\sqrt{-4} + 10$

90. Simplify $\sqrt{-175}$ using the imaginary number *i*.

91. $(-1 + 6i) + (-4 + 2i)$

92. $(2 - 5i) - (3 + 4i)$

93. $(2 + 5i)(-1 + 5i)$

94. $(-6i)(-6i)$

Topic 10 - Simplify the square root expression. Use absolute value symbols if needed.

95. $\sqrt{6} \cdot \sqrt{2}$

96. $\dfrac{\sqrt{3} - \sqrt{6}}{\sqrt{3} + \sqrt{6}}$

97. $4\sqrt{3} - 3\sqrt{4}$

98. $-\sqrt{5} - 3\sqrt{36} + 6\sqrt{5}$

99. $-\sqrt{6} - 6\sqrt{4} - 3\sqrt{6}$

100. $\sqrt{36g^6}$