My Math Plan Assessment #2 Study Guide

1. Find the **x-intercept** and the **y-intercept** of the linear equation.

    $8x - 3y = 43$

2. Use factoring to solve the quadratic equation.

    $x^2 + 9x + 1 = -17$

3. Multiply and simplify the radical expression.

    $(\sqrt{3} - 5)(\sqrt{5} - 2)$

4. Multiply and simplify the radical expression.

    $(\sqrt{7} - 9)(\sqrt{7} + 5)$

5. Perform the indicated operations and simplify.

    $5\sqrt{20} + 5\sqrt{45} - 4\sqrt{80}$

6. Perform the indicated operations and simplify.

    $4\sqrt{50} + 3\sqrt{32} - 3\sqrt{98}$

7. Simplify the expression using the properties of exponents. (The answer should contain only positive exponents.)

    $$\left(\frac{2a^3b^{-1}}{b^3}\right)^2$$

8. Simplify the expression.

    $\sqrt[3]{-72x^{12}}$

9. Solve the linear inequality.

    $2x + 5 < -11$

10. Solve the linear inequality.

$$-3x + 15 > -12$$

11. Solve the linear inequality.

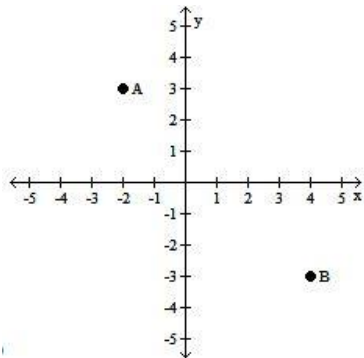$$-2x + 4 \geq -8$$

12. Solve the linear inequality.

$$3x - 12 \leq -4$$

13. Rationalize the denominator and simplify if possible.

$$\frac{3}{2 - \sqrt{7}}$$

14. Rationalize the denominator and simplify if possible.

$$\sqrt[3]{\frac{x^5}{9xy}}$$

15. Identify the coordinates of points A and B.

16. Kara has five exam scores of 67, 74, 60, 85, and 87 in her biology class. What score does she need on the final exam to have a mean (average) grade of 72? Round your answer to two decimal places, if necessary. (All exams have a maximum of 100 points.)

17. The price of a computer is $250. The sales tax is 7%. What is the total cost of the computer?

18. Find the missing rate, base, or amount.

40% of 259 is _____

19. Solve the linear equation using equivalent equations to isolate the variable.

$11x + 7x = 35 + 29$

20. Solve the linear equation using equivalent equations to isolate the variable. Express your solution as an integer or as a simplified fraction.

$$\frac{7}{3}x - \frac{5}{3}x = \frac{-1}{7} + \frac{2}{7}$$

21. A real estate agent works on a 13% commission. What is her commission on a house that she sold for $859,300? Follow the problem-solving process and round your answer to the nearest cent, if necessary.

22. Evaluate the following algebraic expression at $x = -4$, $y = 2$ and simplify your answer.

$-2x^2 + 5y^2 - 6$

23. Solve the linear equation and simplify your answer. Express your solution as an integer, a simplified fraction, or a decimal rounded to two decimal places.

$-6y + 15 = 9y - 15$

24. Solve the following linear equation and simplify your answer.

$-2 - 3(y - 6) = 5(4y - 2) - 7$

25. Find the slope determined by the following pair of points.

$(-2, 7), (7, 3)$

26. Find the equation (in slope-intercept form) of the line passing through the points with the given coordinates.

$(3, -2), (6, 5)$

27. Perform the indicated operation by removing the parentheses and combining like terms.

$(6x^2 - 12) + (9x^2 - 14x - 4)$

28. Multiply the polynomials using the distributive property and combine like terms.

$(x + 4)(2x - 3)$

29. Multiply the polynomials using the distributive property and combine like terms.

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

30. Factor the given polynomial by finding the greatest common monomial factor (or the negative of the greatest common monomial factor) and rewrite the expression.

$-14x - 56xy - 63x^2$

31. Completely factor the trinomial, if possible.

$4t^2 + 25t + 6$

32. Completely factor the trinomial, if possible.

$6t^3 + 41t^2 - 7t$
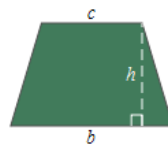
33. Completely factor the polynomial, if possible.

$25 - 81x^2$

34. Solve the following formula for the indicated variable.

$P = 2l + 2w$; solve for w

35. The area of a trapezoid is 44 square meters. One base is 3 meters long and the other is 8 meters long. Find the height of the trapezoid.

$A = \frac{1}{2}h(b + c)$

36. Simplify the expression. Assume all variables represent positive numbers.

$\sqrt{48x^3y^6}$

37. The sum of two consecutive integers is -175. Find the two integers.

38. 14 times the difference between a number and 5 is equal to -98. Find the number.

39. Evaluate the expression at $x = 3, y = -2$, and $z = 4$.

$$\frac{8x-2y}{3z}$$

40. The discount on a new refrigerator was \$225. This was a discount of 20%. What was the original price of the refrigerator?

41. Completely factor the polynomial, if possible.

$$x^3 - 27y^3$$

42. Completely factor the polynomial, if possible.

$$2x + 2y + bx + by$$

43. Simplify the expression using the properties of exponents.

$$3x^0 - 5y^0$$

44. Find the GCF for the set of terms.

$$28c^2d^4, 14c^3, 42cd^3$$

45. Perform the indicated operation by removing the parentheses and combining like terms.

$$(4b^3 - 3b^2 + b) - (-2b^3 + b^2 - 5b)$$

46. Identify the vertex of the parabola with the given equation.

$$f(x) = (x - 5)^2 - 7$$

47. Find the value of the function.

Find $f(-6)$ for $f(x) = -2x + 11$

48. Graph the linear inequality.

$-3x + 2y < 8$

49. Graph the linear inequality.

$6x - 4y \geq 16$

50. Multiply the complex numbers.

$(3 + 4i)(-9 - 7i)$

51. Solve the radical equation.

$\sqrt{16x^2 + 9x + 1} = 4x + 2$

52. Solve the radical equation.

$\sqrt{11x - 2} = x + 2$

53. Solve the radical equation.

$\sqrt{-2 + 3x} - 4 = 5$

54. Solve the quadratic equation using the Quadratic Formula:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$
$$5x^2 + 9x = -1$$

55. Solve the quadratic equation using the Quadratic Formula:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$
$$3x^2 + 8x = -7$$

56. Solve the quadratic equation.

$(x - 5)^2 = -18$

57. Solve the quadratic equation.

$$(x + 9)^2 = 4$$

58. Solve the quadratic equation.

$$x^2 - 12 = 0$$

59. In a certain kennel, the ratio of cats to dogs is 3 to 4. If there are 133 cats and dogs in the kennel, how many dogs are there?

60. State the domain of the function, using interval notation.

$$f(x) = \frac{x - 3}{x^2}$$

61. State the domain of the function, using interval notation.

$$f(x) = \frac{x - 5}{x + 9}$$

62. Simplify the following expression. If the expression is not a real number, indicate "Not a Real Number".

$$\left(\frac{27}{64}\right)^{\frac{2}{3}}$$

63. The distance that a free falling object falls is directly proportional to the square of the time it falls (before it hits the ground). If an object fell 145 ft in 3 seconds, how far will it have fallen by the end of 9 seconds? (Leave the variation constant in fraction form or round to at least 2 decimal places. Round your final answer to the nearest foot.)

64. Divide using the division algorithm. Write your answer in the form $Q + \frac{R}{D}$ where the degree of R is less than the degree of D.
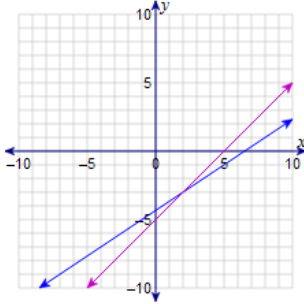
$$\frac{8x^2 - 2x + 5}{4x + 3}$$

65. Simplify the following radical.
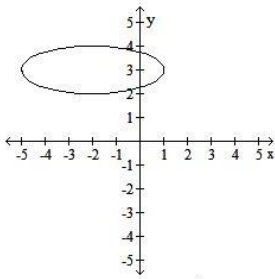
$$\sqrt{-27}$$

66.   Find the quotient. Express your answer in standard form.

$$\frac{-3 + 2i}{7 - 4i}$$

67.   Determine the solution of the system of equations represented by the lines in the graph. Check your solution by substituting into both equations.

68.   Find the domain and range of the relation. Express your answers in interval notation.

69.   Write an equation, in slope-intercept form, of the line through the given point P with the given characteristic.

$$P(-5, 4);\ 5x - 4y = 9$$

   a.   Parallel to the given line
   b.   Perpendicular to the given line

70.   Solve the equation.

$$\frac{2}{x^2 - 9} = \frac{1}{x^2} + \frac{1}{x^2 - 3x}$$

71.   Solve the equation.

$$\frac{x}{x - 3} - \frac{2x + 3}{x^2 + x - 12} = \frac{x - 1}{x + 4}$$

72.   Solve the equation.

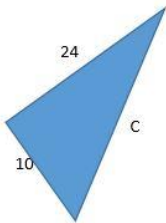$$\frac{2}{x-3} + \frac{x}{x-1} = \frac{x^2}{x^2 - 4x + 3}$$

73.   Find the product of the binomial factors.

$(2x - 3)^2$

74.   Perform the indicated operation of addition and reduce your answer to lowest terms.

$$\frac{x+3}{x+4} + \frac{x-4}{x-3}$$

75.   Find the missing length.

76.   Reduce the following rational expression to its lowest terms.

$$\frac{3y^2 + 14y - 24}{18 - 9y - 2y^2}$$

77.   Solve the application.
A rectangle has a length of 21 feet less than 5 times its width. If the area of the rectangle is 468 square feet, find the length of the rectangle.

78.   Multiply the rational expressions and simplify.

$$\frac{4x^2 + 6x}{x^2 + 3x - 10} \cdot \frac{x^2 + 4x - 12}{x^2 + 5x - 6}$$

79.   Simplify the complex rational expression.

$$\frac{\dfrac{9x^2 + 3}{27x^2}}{\dfrac{24x^2 + 8}{21x^4}}$$

80. Find the solution of the system.

$$\begin{cases} 16x + 2y = -30 \\ 2x + y = 3 \end{cases}$$

81. Find the solution of the system.

$$\begin{cases} y = -6x + 30 \\ -18x + 6y = -36 \end{cases}$$

82. If Ryan has \$1161 left after spending $\frac{1}{5}$ of his monthly salary for rent and $\frac{1}{8}$ of his monthly salary for his credit card bill, what was his monthly salary?

83. Perform the indicated operation of multiplication or division on the rational expressions and simplify.

$$\frac{9s^2}{8t^3} \div \frac{9s}{2t^2}$$

84. Find the product. Express your answer in standard form.

$$-6i(3 - 7i)$$

85. Tim and Stanley leave Stanley's house at the same time. Tim drives north and Stanley drives west. Tim's average speed is 9 mph slower than Stanley's. At the end of one hour, they are 85 miles apart. Find Stanley's average speed. (Round your answer to the nearest tenth.)

86. Factor the polynomial.   If the polynomial does not factor, write "not factorable".

$$25x^2 + 9$$

87. Solve the application.
Davia is working her way through school. She works two part time jobs for a total of 32 hours a week. Job A pays \$8.30 per hour and Job B pays \$10.20 per hour. How many hours did she work at each job in a week when she earned a total of \$301.70?

88. Find the domain and range of the relation. Express your answers in interval notation.
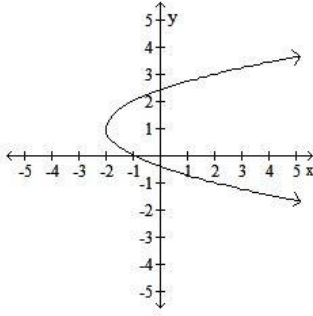
89. Solve the equation.

$$\frac{x}{x-4} - \frac{4}{2x-1} = 1$$

90. A total of $7000 is invested: part at 6% and the remainder at 10%. How much is invested at each rate if the annual interest is $520?

91. A dairy farmer wants to mix a 45% protein supplement and a standard 20% protein ration to make 1800 pounds of a high-grade 30% protein ration. How many pounds of each should he use?

92. Solve the following linear equation.

$$\frac{3}{8}\left(y - \frac{1}{2}\right) = \frac{1}{8}\left(y + \frac{1}{2}\right)$$

93. Consider the function:

$f(x) = 8x + 7$
a.   Find the value of $f(-2)$.
b.   Find the value of $f(a + 3)$.

94. Consider the function:
$f(x) = 3x^2 + 4x + 8$

a.   Find the value of $f(-9)$.
b.   Find the value of $f(a)$.

95. Simplify the following expression. If the expression is not a real number, indicate "Not a Real Number".

$$\left(\frac{25}{64}\right)^{\frac{-1}{2}}$$

96. Two planes, which are 2660 miles apart, fly toward each other. Their speeds differ by 65 mph. If they pass each other in 4 hours, what is the speed of each plane?

97. Simplify the following complex fraction.

$$\frac{2 + \frac{1}{x}}{4 - \frac{2}{x^2}}$$

98. Shirley and Pam, working together, can mow the lawn in 6 hours. Working alone, Pam takes three times as long as Shirley. How long does it take Shirley to mow the lawn alone?

99. An airplane can travel 440 mph in still air. If it travels 950 miles with the wind in the same length of time it travels 810 miles against the wind, what is the speed of the wind?

100. z varies directly as x^2 and inversely as y^2. If $z = 156$ when $x = 9$ and $y = 4$, find z if $x = 6$ and $y = 9$. (Round off your answer to the nearest hundredth.)

Answer Key

1. x-int: $(\frac{43}{8}, 0)$ y-int: $(0, \frac{-43}{3})$
2. $x = -6, -3$
3. $\sqrt{15} - 2\sqrt{3} - 5\sqrt{5} + 10$
4. $-38 - 4\sqrt{7}$
5. $9\sqrt{5}$
6. $11\sqrt{2}$
7. $\frac{4a^6}{b^8}$
8. $-2x^4\sqrt[3]{9}$
9. $x < -8$
10. $x < 9$
11. $x \le 6$
12. $x \le \frac{8}{3}$
13. $-2 - \sqrt{7}$
14. $\frac{x\sqrt[3]{3xy^2}}{3y}$
15. $A = (-2, 3)$ $B = (4, -3)$
16. 59
17. $\$267.50$
18. 103.6
19. $x = \frac{32}{9}$
20. $x = \frac{3}{14}$
21. $\$111,709$
22. -18
23. $y = 2$
24. $y = \frac{33}{23}$
25. $m = \frac{-4}{9}$
26. $y = \frac{7}{3}x - 9$
27. $15x^2 - 14x - 16$
28. $2x^2 + 5x - 12$
29. $x^3 - 8$
30. $-7x(9x + 8y + 2)$
31. $(4t + 1)(t + 6)$
32. $t(6t - 1)(t + 7)$
33. $(5 - 9x)(5 + 9x)$
34. $w = \frac{P - 2l}{2}$
35. $h = 8$ m
36. $4xy^3\sqrt{3x}$
37. $-88, -87$
38. -2
39. $\frac{7}{3}$
40. $\$1125$
41. $(x - 3y)(x^2 + 3xy + 9y^2)$
42. $(x + y)(2 + b)$
43. -2
44. $14c$

45. $6b^3 - 4b^2 + 6b$
46. $(5, -7)$
47. 23
48.
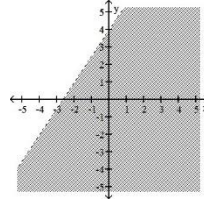
49.
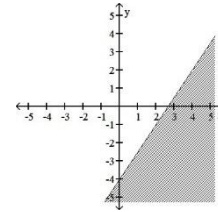
50. $1 - 57i$
51. $x = \frac{-3}{7}$
52. $x = \{1, 6\}$
53. $x = \frac{83}{3}$
54. $x = \frac{-9 \pm \sqrt{61}}{10}$
55. $x = \frac{-4 \pm i\sqrt{5}}{3}$
56. $x = 5 \pm 3i\sqrt{2}$
57. $x = \{-11, -7\}$
58. $x = \pm 2\sqrt{3}$
59. 76 dogs
60. $(-\infty, 0) \cup (0, \infty)$
61. $(-\infty, -9) \cup (-9, \infty)$
62. $\frac{9}{16}$
63. 1305 ft
64. $2x - 2 + \frac{11}{4x + 3}$
65. $3i\sqrt{3}$
66. $\frac{-29}{65} + \frac{2}{65}i$
67. $(2, -3)$
68. D: $[-5, 1]$ R: $[2, 4]$
69. a. $y = \frac{5}{4}x + \frac{41}{4}$ b. $y = \frac{-4}{5}x$
70. no solution
71. $x = 1$
72. $x = -2$
73. $4x^2 - 12x + 9$
74. $\frac{2x^2 - 25}{(x + 4)(x - 3)}$
75. $c = 26$
76. $\frac{3y - 4}{3 - 2y}$

77.	39 ft
78.	$\frac{2x(2x+3)}{(x+5)(x-1)}$
79.	$\frac{7x^2}{24}$
80.	$x = -3, y = 9$
81.	$x = 4, y = 6$
82.	$1720
83.	$\frac{s}{4t}$
84.	$-42 - 18i$
85.	64.4 mph
86.	not factorable
87.	Job A: 13 hours and Job B: 19 hours
88.	D: $[-2, \infty)$ R: $(-\infty, \infty)$
89.	$x = -3$

90.	$4500 at 6% and $2500 at 10%
91.	720 lbs of 45% protein supplement; 1080 lbs of 20% protein ration
92.	$y = 1$
93.	a. -9 b. $8a + 31$
94.	a. 215 b. $3a^2 + 4a + 8$
95.	$\frac{8}{5}$
96.	300 mph, 365 mph
97.	$\frac{x(2x-1)}{2(2x^2-1)}$
98.	8 hours
99.	35 mph
100.	$z = 13.70$