Math 96 Exam 1 Study Guide
Exam will consist of a sampling of questions similar to the ones below

Order of Operations:

1. Evaluate: $19(67 - (7 + 1)^2))$
2. Evaluate: $88 - 4(7 - 3)^2 + 2^3$
3. Evaluate and write your answer in simplest form: $\frac{2}{3} - \frac{1}{6} \cdot \frac{1}{4}$
4. Evaluate and write your answer in simplest form: $\frac{5}{8} \cdot \frac{1}{3} + \frac{1}{6}$
5. Evaluate: $(-2 - 1)^2 + (2 \cdot 1)^3$
6. Evaluate: $2^3 \cdot (-1) + 4 - (-4)^3$

Solving Linear Equations:

7. Solve for $x$: $-7 = \frac{x + 38}{-8}$
8. Solve for $x$: $\frac{5x - 17}{-3} = -6$
9. Solve for $w$: $-3w + 7 = -9w + 49$
10. Solve for $v$: $7v + 23 = 4v + 8v - 22$
11. Solve for $x$: $8x + 8(x - 5) = -8$
12. Solve for $y$: $21 = -6y + 3(y + 4)$
13. Solve for $u$: $2u - 9 = -5(u - 1)$
14. Solve for $w$: $5w - 8 = 3(2 + 4)$
15. Solve for $x$: $-3(5x - 7) + 2x = 3(x + 3)$
16. Solve for $u$:
\[3(u - 8) - 1 = -4(-3u + 4) - 3u\]

17. Solve for $x$:
\[\frac{x}{10} - \frac{x}{8} = \frac{5}{8}\]

18. Solve for $y$:
\[\frac{y}{4} + 4 = \frac{y}{5}\]

19. Solve for $x$:
\[\frac{1}{6}x - \frac{5}{3} = -\frac{1}{9}\]

20. Solve for $w$:
\[-\frac{1}{8} - \frac{1}{2} = \frac{1}{3}\]

21. Solve for $v$:
\[-v + \frac{1}{3} = -\frac{2}{3}v - \frac{3}{2}\]

22. Solve for $x$:
\[-\frac{4}{5}x + 7 = -\frac{5}{3}x - \frac{7}{5}\]

23. Solve for $u$:
\[\frac{8u - 3}{2} - \frac{8u + 1}{6} = 17\]

24. Solve for $x$:
\[\frac{7x + 7}{6} = 5 - \frac{2x + 6}{3}\]

**Linear Inequalities:**

25. Graph the set \(\{x| -4 \leq x \leq 2\}\) on a number line, then write the set using interval notation.

26. Graph the set \(\{x| x < 1\}\) on a number line, then write the set using interval notation.

27. Solve the inequality for $w$:
\[4w - 13 \leq 2w - 5\]

28. Solve the inequality for $x$:
\[19 - 3x > 4 - 6x\]

29. Solve the inequality for $u$:
\[5(3u + 9) \geq 9u + 33\]

30. Solve the inequality for $x$:
\[-5x + 3(x - 7) < -33\]
31. Solve the compound inequality and write your answer in interval notation:
   
   \[-26 \leq 4x - 2 < 18\]

32. Solve the compound inequality and write your answer in interval notation:
   
   \[-7 < -2x + 3 \leq 15\]

   **Solving linear equations for variables:**

33. Solve for \(a\):
   
   \(P = a - 3b - c\)

34. Solve for \(y\):
   
   \(K = 4yz\)

35. Solve for \(x\):
   
   \(z = 5x - 9y\)

36. Solve for \(B\):
   
   \(4B + C = A\)

37. Solve for \(x\):
   
   \(y = 4(x + 7)\)

38. Solve for \(b\):
   
   \(6(b + 8) = r\)

39. Solve for \(k\):
   
   \(f = \frac{g - h + k}{3}\)

40. Solve for \(G\):
   
   \(D = \frac{3}{4}(F - G)\)

   **Solving absolute value equations and inequalities:**

41. Solve for \(x\). If there is no solution, write “No Solution”:
   
   \(|x| = 5\)

42. Solve for \(x\). If there is no solution, write “No Solution”:
   
   \(|x| = 0\)

43. Solve for \(x\). If there is no solution, write “No Solution”:
   
   \(-3|x| = 15\)

44. Solve for \(x\). If there is no solution, write “No Solution”:
   
   \(|x| - 13 = -5\)
45. Solve for $x$. If there is no solution, write “No Solution”:
$|3x - 12| = 6$

46. Solve for $x$. If there is no solution, write “No Solution”:
$|5x + 15| = -10$

47. Solve for $x$. If there is no solution, write “No Solution”:
$|4x - 8| + 14 = 50$

48. Solve for $x$. If there is no solution, write “No Solution”:
$3|x - 4| + 7 = 52$

49. Graph the solution to the inequality on a number line:
$|x| > 8$

50. Graph the solution to the inequality on a number line:
$|x| \leq 4$

51. Solve the inequality:
$|u| + 14 \geq 21$

52. Solve the inequality:
$-5|x| > 40$

53. Which of the following ordered pairs $(x, y)$ are solutions to the inequality $2x - 9y \geq -10$:
$(-7, -4), (8, 5), (-5, 0), (-4, 1)$

54. Which of the following ordered pairs $(x, y)$ are solutions to the inequality $5x + 7y \geq -3$:
$(-9, 6), (0, 2), (2, 3), (3, -5)$

55. Graph the inequality in the coordinate plane:
$y \leq -6$

56. Graph the inequality in the coordinate plane:
$x \geq 1$

57. Graph the inequality in the coordinate plane:
$y \geq 5x + 2$

58. Graph the inequality in the coordinate plane:
$y < -\frac{1}{2}x + 4$

59. Graph the solution to the system of inequalities in the coordinate plane:
$y \geq 2x + 3$
$y > -5x - 3$
60. Graph the solution to the system of inequalities in the coordinate plane:
\[
\begin{align*}
y &> 3x + 7 \\
y &\leq -4x + 3
\end{align*}
\]

61. Solve the following system of equations. If the system does not have a unique solution, state whether it has no solution or an infinite number of solutions.
\[
\begin{align*}
-5x + 2y &= -17 \\
x &= 3y + 6
\end{align*}
\]

62. Solve the following system of equations. If the system does not have a unique solution, state whether it has no solution or an infinite number of solutions.
\[
\begin{align*}
5x + 2y &= 31 \\
-2x + y &= -7
\end{align*}
\]

63. Solve the following system of equations. If the system does not have a unique solution, state whether it has no solution or an infinite number of solutions.
\[
\begin{align*}
-8x + 3y &= 3 \\
13x - 3y &= -18
\end{align*}
\]

64. Solve the following system of equations. If the system does not have a unique solution, state whether it has no solution or an infinite number of solutions.
\[
\begin{align*}
7x + 6y &= 4 \\
9x + 6y &= 12
\end{align*}
\]

65. Solve the following system of equations. If the system does not have a unique solution, state whether it has no solution or an infinite number of solutions.
\[
\begin{align*}
7x + 4y &= 16 \\
-4x - 5y &= -1
\end{align*}
\]

66. Solve the following system of equations. If the system does not have a unique solution, state whether it has no solution or an infinite number of solutions.
\[
\begin{align*}
3x + 5y &= -7 \\
-9x - 7y &= 5
\end{align*}
\]

67. Solve the following system of equations. If the system does not have a unique solution, state whether it has no solution or an infinite number of solutions.
\[
\begin{align*}
\frac{1}{6}x - \frac{1}{5}y &= 2 \\
\frac{1}{3}x - \frac{2}{5}y &= -5
\end{align*}
\]
68. Solve the following system of equations. If the system does not have a unique solution, state whether it has no solution or an infinite number of solutions.
\[
\begin{align*}
\frac{1}{5}x - 2y &= -\frac{2}{5} \\
\frac{1}{4}x + \frac{1}{3}y &= 8
\end{align*}
\]

69. Solve the following system of equations. If the system does not have a unique solution, state whether it has no solution or an infinite number of solutions.
\[
\begin{align*}
-0.7x + 0.9y &= 2.5 \\
0.21x - 0.16y &= 0.24
\end{align*}
\]

70. Solve the following system of equations. If the system does not have a unique solution, state whether it has no solution or an infinite number of solutions.
\[
\begin{align*}
0.3x - 1.2y &= 4.2 \\
1.1x - 0.4y &= 3.4
\end{align*}
\]

71. Solve the following system of equations. If the system does not have a unique solution, state whether it has no solution or an infinite number of solutions.
\[
\begin{align*}
-x - 2y &= 4 \\
x + 2y &= 4
\end{align*}
\]

72. Solve the following system of equations. If the system does not have a unique solution, state whether it has no solution or an infinite number of solutions.
\[
\begin{align*}
-x &= 2y - 4 \\
x + 2y &= 4
\end{align*}
\]
73. Solve the following system of equations. If the system does not have a unique solution, state whether it has no solution or an infinite number of solutions.

\[ -x + 3y = 9 \]
\[ x + 3y = -9 \]

Applications:

74. A fruit company delivers its fruit in two types of boxes: large and small. A delivery of 2 large boxes and 5 small boxes has a total weight of 57 kilograms. A delivery of 8 large boxes and 3 small boxes has a total weight of 126 kilograms. How much does each type of box weigh?

75. A party rental company has chairs and tables for rent. The total cost to rent 2 chairs and 5 tables is $45. The total cost to rent 8 chairs and 3 tables is $44. What is the cost to rent each chair and each table?

76. A phone company offers two monthly plans. Plan A costs $8 plus an additional $0.13 for each minute of calls. Plan B costs $23 plus an additional $0.08 for each minute of calls.

(a) For what amount of calling do the two plans cost the same?
(b) What is the cost when the two plans cost the same?

77. Josh will rent a car for the weekend. He can choose one of two plans. The first plan has an initial fee of $46 and costs an additional $0.15 per mile driven. The second plan has an initial fee of $53 and costs an additional $0.10 per mile driven.

(a) For what amount of driving do the two plans cost the same?
(b) What is the cost when the two plans cost the same?
Rules of Exponents

78. Simplify and use only positive exponents in your answer: \(-3w^5(-4w^2)\)

79. Simplify and use only positive exponents in your answer: \(6u^6v^8 \cdot 2v^7 \cdot 4u\)

80. Simplify and use only positive exponents in your answer: \(\frac{7y^4}{35y^6}\)

81. Simplify and use only positive exponents in your answer: \(\frac{x^7z}{x^3z^4}\)

82. Simplify and use only positive exponents in your answer: \(\frac{36v^3w^4}{45v^4w^2}\)

83. Simplify and use only positive exponents in your answer: \(\frac{40y^5z^2}{4y^2z^2}\)

84. Simplify and use only positive exponents in your answer: \((5b^2a^3)^3\)

85. Simplify and use only positive exponents in your answer: \((-7b^4a^2)^2\)

86. Simplify and use only positive exponents in your answer: \(\left(\frac{-2z}{y^3}\right)^5\)

87. Simplify and use only positive exponents in your answer: \(\left(\frac{w^3}{-5y^2}\right)^2\)

88. Simplify and use only positive exponents in your answer: \(\frac{2n^5}{3m^2n^7}\)

89. Simplify and use only positive exponents in your answer: \(\frac{(2x^2)^4}{(3x^3)^2}\)

90. Evaluate: \((-2)^0\)

91. Evaluate: \(3 \left(\frac{4}{9}\right)^0\)

92. Rewrite the following without an exponent: \(2^{-3}\)

93. Rewrite the following without an exponent: \(\left(\frac{7}{4}\right)^{-1}\)

94. Rewrite the following without an exponent: \(\left(\frac{4}{5}\right)^{-2}\)

95. Rewrite the following without an exponent: \((-5)^{-1}\)

96. Rewrite the following without an exponent: \((-9)^{-2}\)

97. Simplify and use only positive exponents in your answer: \(4y^{-4}\)
98. Simplify and use only positive exponents in your answer: \( \frac{1}{-4y^{-6}} \)

99. Simplify and use only positive exponents in your answer: \( w^{-6} \cdot w^9 \cdot w^2 \)

100. Simplify and use only positive exponents in your answer: \( u^{-4} \cdot u^6 \cdot u^{-3} \)

101. Simplify and use only positive exponents in your answer: \( \frac{x^{-9}}{x^{-7}} \)

102. Simplify and use only positive exponents in your answer: \( \frac{z^{-4}}{z^6} \)

103. Simplify and use only positive exponents in your answer: \( (v^7)^{-2} \)

104. Simplify and use only positive exponents in your answer: \( (x^{-7})^{-5} \)

105. Simplify and use only positive exponents in your answer: \( (2b^2c^{-3})^4 \)

106. Simplify and use only positive exponents in your answer: \( (4x^6y^{-4})^{-3} \)

107. Simplify and use only positive exponents in your answer: \( \left( \frac{4y^4}{3y^{-1}} \right)^3 \)

108. Simplify and use only positive exponents in your answer: \( \left( \frac{m^{-3}}{3m^6} \right)^{-2} \)

109. Evaluate: \( 10^{-6} \)