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

Section 4.1

1. Evaluate: \((5^3)(5^0)\)
2. Evaluate: \(3^{-3}\)
3. Evaluate: \(-8^{-2}\)
4. Evaluate: \((-2)^{-4}\)
5. Simplify and use only positive exponents in your answer: \(y^6 \cdot y^8\)
6. Simplify and use only positive exponents in your answer: \(a^2 \cdot a^{-6} \cdot a^{10}\)
7. Simplify and use only positive exponents in your answer: \(y^{-3} \cdot y^0 \cdot y^{-1}\)
8. Simplify and use only positive exponents in your answer: \(\frac{x^6}{x^9}\)
9. Simplify and use only positive exponents in your answer: \(\frac{x^4 \cdot x^{-6}}{x^7 \cdot x^{-1}}\)
10. Simplify and use only positive exponents in your answer: \((x^6)^3\)
11. Simplify and use only positive exponents in your answer: \((x^5 \cdot x^0)^{-2}\)
12. Simplify and use only positive exponents in your answer: \(\frac{a^3 \cdot a^{-5}}{(a^9)^2}\)
13. Simplify and use only positive exponents in your answer: \(\frac{(a^2)^{-5}}{a^6 \cdot a^{-1}}\)
14. Simplify and use only positive exponents in your answer: \(\left(\frac{x^2}{-4y^{-5}}\right)^{-1}\)
15. Simplify and use only positive exponents in your answer: \(\left(\frac{x^6 \cdot y^{-1}}{2x^{-6} \cdot y^2}\right)^{-2}\)

Section 4.2

16. Simplify the expression: \((7t^2 - 4t + 6) + (-t^2 + 5t + 3)\)
17. Simplify the expression: \((-2x^2 + 7xy - 6y^2) + (3x^2 + 4xy + 5y^2)\)
18. Simplify the expression: \((3x^2 + x + 5) - (2x^2 + 6x - 7)\)
19. Simplify the expression: \((4x^4 + 2) - (5x^3 - 6x - 3)\)
20. Simplify the expression: \((2x^2 + x - 6) + (3x^4 + 7x^2 + 4)\)
21. Simplify the expression: \((x^3 + 6x^2 - 7x - 3) - (4x^3 - x + 2)\)
22. Simplify the expression: \((2y^3 + 7y^2) - (7y^2 - 7y + 3) - (-y^3 + 6y^2 - 2)\)

**Section 4.3**

23. Multiply and simplify if possible: \(8x^4(7x^2 + 3x - 1)\)
24. Multiply and simplify if possible: \(x^2y(10x^2 - 2y)\)
25. Multiply and simplify if possible: \((x - 3)(x + 8)\)
26. Multiply and simplify if possible: \((x - 5)(x - 1)\)
27. Multiply and simplify if possible: \((2x + 5)(6x - 5)\)
28. Multiply and simplify if possible: \((2x + 7)(4x + 5)\)
29. Square and simplify if possible: \((4x - 2)^2\)
30. Square and simplify if possible: \((3x + 4y)^2\)
31. Multiply and simplify if possible: \((x - 4y)(x + 4y)\)
32. Multiply and simplify if possible: \(x(8x^2 - 1)(8x^2 + 1)\)
33. Multiply and simplify if possible: \((x + 4)(6x^2 - 3x - 7)\)
34. Square and simplify if possible: \((7x^2 - 4)^2\)
35. Square and simplify if possible: \([(x + 3) + 8]^2\)
36. Multiply and simplify if possible: \(\left(x + \frac{2}{3}\right)\left(x - \frac{2}{3}\right)\)

**Section 4.4**

37. Divide: \(\frac{14x^4 + 8x^3 - 18x}{2x}\)
38. Divide: \(\frac{36x^7 - 8x^5 + 4x^4}{4x^3}\)
39. Divide: \(\frac{18x^6 - 27x^5 + 15x^3 - 45x^2}{9x^2}\)
40. Divide: \((3x^2 + 15x + 16) ÷ (3x + 3)\)
41. Divide: \((x^2 - 17x + 66) ÷ (x - 6)\)
42. Divide: \((4x^3 - 8x^2 + 16x - 13) ÷ (x - 1)\)
43. Divide: \((8x^3 + 4x^2 - 7) \div (x + 2)\)
44. Divide: \((12x^3 + 17x^2 - 3x - 14) \div (3x + 2)\)

**Section 4.5**

45. Factor: \(-10y^2 + 6y^3\)
46. Factor: \(5a^5 - 25a^4\)
47. Factor: \(12x^2y - 28xy\)
48. Factor: \(20x^2y + 5xy - 10xy^2\)
49. Factor by grouping: \(bx - by + 7x - 7y\)
50. Factor by grouping: \(xy + 6x - 4y - 24\)
51. Factor by grouping: \(15xy + 9x + 5y + 3\)
52. Factor by grouping: \(4x^3 - 12x^2 - 3x + 9\)

**Sections 4.6 and 4.7**

53. Factor Completely: \(x^2 + 3x - 18\)
54. Factor Completely: \(x^2 - 8x - 20\)
55. Factor Completely: \(x^2 - 81\)
56. Factor Completely: \(x^2 + 10x + 16\)
57. Factor Completely: \(x^2 - 17x + 30\)
58. Factor Completely: \(x^2 + 25\)
59. Factor Completely: \(x^2 - 8x + 16\)
60. Factor Completely: \(25x^2 - 9\)
61. Factor Completely: \(7x^2 + 12x - 4\)
62. Factor Completely: \(4x^2 + 28x + 49\)
63. Factor Completely: \(-3x^2 + 36x - 60\)
64. Factor Completely: \(4x^2 - 16\)
65. Factor Completely: \(3x^2 + 10x + 8\)
66. Factor Completely: \(4x^2 - 25x + 25\)
67. Factor Completely: \(25x^2 - 60x + 36\)
68. Factor Completely: $-2x^2 - x + 21$

69. Factor Completely: $3x^2 - 147$

70. Factor Completely: $(3x - y)^2 + (3x - y) - 12$

71. Factor Completely: $2(x + 5)^2 - 2(x + 5) - 60$

72. Factor Completely: $(x + y)^2 + 18(x + y) + 81$

73. Factor Completely: $x^2(x + 9) + 4x(x + 9) - 21(x + 9)$

74. Factor Completely: $x^3 - 125$

75. Factor Completely: $x^3 + 27$

76. Factor Completely: $4x^3 - 32$

77. Factor Completely: $8x^3 + 27y^3$

78. Factor Completely: $5x^3 - 30x^2 - 70x$

79. Factor Completely: $x^3 - 2x^2 - 25x + 50$

80. Factor Completely: $3x^4 - 29x^3 + 18x^2$

81. Factor Completely: $75x^4 - 12x^2$

82. Factor Completely: $x^6 + 8y^3$