

MATH 126 SAMPLE EXAM QUESTIONS – SPRING 2018

This problem set has been designed to provide you with an understanding of the types of problems you should be able to perform in order to be successful in this class. Most of the problems are odd numbered problems taken from the textbook. The answers should be in the back of the book so that you can check your answer once completed. For the even problems or “extra” problems listed, check with your instructor for the solutions.

CHAPTER 1

Section 1.1

Perform the indicated operations:

25. $\frac{3}{10} + \frac{4}{15}$

29. a) $\frac{2}{\frac{2}{3}} - \frac{\frac{2}{3}}{2}$ b) $\frac{\frac{1}{12}}{\frac{1}{8} - \frac{1}{9}}$

Express the interval in terms of an inequality and graph:

45. $(-3, 0)$

47. $[2, 8)$

49. $[2, \infty)$

Graph the set:

59. $(-2, 0) \cup (-1, 1)$

61. $[-4, 6] \cap [0, 8)$

63. $(-\infty, -4) \cup (4, \infty)$

Section 1.2

Evaluate each expression:

19. a) $\sqrt{16}$ b) $\sqrt[4]{16}$ c) $\sqrt[4]{\frac{1}{16}}$

Simplify the expression:

29. $\sqrt{32} + \sqrt{18}$

31. $\sqrt[5]{96} + \sqrt[5]{3}$

33. $\sqrt{16x} + \sqrt{x^5}$

Simplify the expression and eliminate any negative exponents:

41. a) $(4x^2y^4)(2x^5y)$ b) $(8a^2z)(\frac{1}{2}a^3z^4)$

43. a) $(5x^2y^3)(3x^2y^5)^4$

49. a) $\frac{8a^3b^{-4}}{2a^{-5}b^5}$ b) $\left(\frac{y}{5x^{-2}}\right)^{-3}$

Simplify the expression and eliminate any negative exponents. Assume all letters represent positive numbers:

65. a) $(8a^6b^{\frac{3}{2}})^{\frac{2}{3}}$

68. a) $\left(\frac{x^8y^{-4}}{16y^{\frac{4}{3}}}\right)^{-\frac{1}{4}}$

73. a) $\sqrt{4st^3}\sqrt[6]{s^3t^2}$ b) $\frac{\sqrt[4]{x^7}}{\sqrt[4]{x^3}}$

Rationalize the denominator:

89. a) $\frac{1}{\sqrt{10}}$ b) $\sqrt{\frac{2}{x}}$ c) $\sqrt{\frac{x}{3}}$

Section 1.3

Find the sum, difference or product:

17. $(x^3 + 6x^2 - 4x + 7) - (3x^2 + 2x - 4)$

21. $2(2 - 5t) + t^2(t - 1) - (t^4 - 1)$

Multiply:

23. $(3t - 2)(7t - 4)$

25. $(3x + 5)(2x - 1)$

29. $(3x + 4)^2$

35. $(x + 5)(x - 5)$

39. $(\sqrt{x} + 2)(\sqrt{x} - 2)$

47. $(2x - 5)(x^2 - x + 1)$

Factor the common factor:

61. $-2x^3 + 16x$

65. $2x^2y - 6xy^2 + 3xy$

Factor:

67. $x^2 + 2x - 3$

71. $3x^2 - 16x + 5$

73. $(3x + 2)^2 + 8(3x + 2) + 12$

75. $9a^2 - 16$

77. $27x^3 + y^3$

83. $x^3 + 4x^2 + x + 4$

85. $2x^2 + x^2 - 6x - 3$

91. $x^{-\frac{3}{2}} + 2x^{-\frac{1}{2}} + x^{\frac{1}{2}}$

93. $(x^2 + 1)^{\frac{1}{2}} + 2(x^2 + 1)^{-\frac{1}{2}}$

121. $(x - 1)(x + 2)^2 - (x - 1)^2(x + 2)$

122. $y^4(y + 2)^3 + y^5(y + 2)^4$

128. $\frac{1}{2}x^{-\frac{1}{2}}(3x + 4)^{\frac{1}{2}} - \frac{3}{2}x^{\frac{1}{2}}(3x + 4)^{-\frac{1}{2}}$

Section 1.4

Find the domain:

5. $4x^2 - 10x + 3$

7. $\frac{2x+1}{x-4}$

9. $\sqrt{x+3}$

11. $\frac{x^2+1}{x^2-x-2}$

EXTRA (not from the book):

A. $\frac{\sqrt{x-4}}{x^2-2x-8}$

B. $\frac{1}{\sqrt{3-x}}$

Perform the multiplication or division and simplify:

25. $\frac{x^2-2x-15}{x^2-9} \cdot \frac{x+3}{x-5}$

33. $\frac{2x^2+3x+1}{x^2+2x-15} \div \frac{x^2+6x+5}{2x^2-7x+3}$

Simplify the compound expression:

59. $\frac{x+\frac{1}{x+2}}{x-\frac{1}{x+2}}$

63. $\frac{\frac{x}{y}-\frac{y}{x}}{\frac{1}{x^2}-\frac{1}{y^2}}$

Rationalize the denominator:

81. $\frac{1}{2-\sqrt{3}}$

83. $\frac{2}{\sqrt{2}+\sqrt{7}}$

86. $\frac{2(x-y)}{\sqrt{x}-\sqrt{y}}$

Section 1.5

Solve the equation:

43. $x^2 + x - 12 = 0$

49. $3x^2 + 5x = 2$

51. $2x^2 = 8$

55. $x^2 + 2x - 5 = 0$

67. $2x^2 + x - 3 = 0$

85. $\frac{1}{x-1} + \frac{1}{x+2} = \frac{5}{4}$

91. $\sqrt{2x+1} + 1 = x$

EXTRA (not from the book):

A. $x^2 - 2x - 5 = 0$

Section 1.6

Refer to WebAssign problems for sample problems from this section.

Section 1.7

Solve the inequality. Express your answer in interval notation.

19. $3x + 11 \leq 6x + 8$

31. $-2 < 8 - 2x \leq -1$

49. $(x+2)(x-1)(x-3) \leq 0$

51. $(x-4)(x+2)^2 < 0$

57. $\frac{x-3}{x+1} \geq 0$

Section 1.8

Sketch the graph and find any x-intercepts or y-intercepts:

59. $2x - y = 6$

65. $y = x^2 - 9$

69. $y = \sqrt{4 - x^2}$

75. $y = 4 - |x|$

Show the equation represents a circle and find the center and radius of the circle:

103. $x^2 + y^2 - 4x + 10y + 13 = 0$

107. $2x^2 + 2y^2 - 3x = 0$

Section 1.10

Find the slope of the line thru P and Q:

9. P(2,4) Q(4,3)

11. P(1,-3) Q(-1,6)

Find the equation of the line that satisfies the given conditions:

23. Through (2,1) and (1,6)

31. Through (1,-6) parallel to $x + 2y = 6$

35. Through (-1, -2) perpendicular to $2x + 5y + 8 = 0$