

Basic Skills Math II: Math051/061 Final Exam Review
Review Sheet

I. Intro. to Real Numbers and Algebraic Expressions

1. Convert to decimal notation: $\frac{5}{8}$
2. Which of the following is the greatest: $\frac{2}{3}$, $\frac{3}{5}$, $\frac{3}{4}$, $\frac{7}{9}$
3. If $x = -4$ and $y = 3$, then $\frac{xy - 2}{2 - x} =$
4. $-\frac{5}{9} - (-\frac{1}{4})$
5. $\frac{2}{3} + \frac{7}{4}$
6. $-\frac{1}{8} \div \frac{5}{12}$
7. Simplify: $3 - 5.73 - (-2.73)$
8. Simplify: $256 \div 64 \div 2^3 + 100$
9. Simplify: $-\frac{7}{2} \left(-\frac{5}{2}\right) \left(\frac{4}{7}\right)$.
10. Evaluate $3x^2$ when $x = -4$
11. $-3(x - 2y + 4z) =$
12. Collect like terms: $2y + \frac{2}{3}y + 2x - \frac{1}{3}y$
13. Simplify: $11 - 2[3 + (5 - 4)8]$
14. $(7a + 3b) - (a - 4b) =$

II. Solving Equations and Equalities

15. Solve for x : $x + \frac{3}{8} = \frac{5}{4}$
16. Solve for x : $8.4 = 5.7 + x$
17. Solve for x : $\frac{2}{3}x = 10.6$
18. Solve for y : $4(2y - 3) = 28$
19. Solve for y : $4y - 3 = 6y + 7$
20. Solve for x : $3 - 2x > x + 12$
21. Solve for x : $2(x - 3) \leq x - 4$
22. If $12t - 6 > 14t + 3$, solve for t
23. $(4m - 2) - (-2m + 1) =$
24. The perimeter of a playground yard is 600 ft. The length is 100 ft more than the width. Find the length.
25. The perimeter P of a rectangle is $P = 2l + 2w$ where l is the length and w is the width of the rectangle. Express the width in terms of the perimeter and the length.
26. Solve $Ax + By + Cz = D$ for y .
27. Your quiz scores are 73, 78, 86, and 91. What score on the fifth quiz will allow you to get an average quiz grade of at least 84?

III. Graphs of Linear Equations

28. Graph $x + y = 5$ and indicate the x - intercept.
29. Graph $x + 2y = -6$ and indicate the y - intercept.
Find the slope of the following lines:

30. $y = \frac{2}{3}x$ 31. $2y + 4 = 0$ 32. $x = -1$ 33. $3x - y = 4$

34. Find the slope of the line containing the points $(6, -6)$ and $(1, 2)$.
35. Find b for the line $y = 6x + b$ containing the point $(4, -2)$.
36. Change $2x + 5y + 3 = 0$ into $y = mx + b$ (slope-intercept) form.
37. Find m for the line $y = mx + 1$ containing the point $(-4, 5)$.
38. What is the graph of $4x - 3y = 12$? 39. What is the graph of $x + 2y = 6$?

IV. Polynomials: Operations

40. Simplify $\frac{5^{-9}}{5^{-2}}$ 45. Simplify: $\left(2x + \frac{1}{2}\right)^2$
41. Simplify $\frac{a^6b^7}{a^9b}$ 46. Simplify: $\frac{12x^3 + 3x^2 - 9x}{3x}$
42. $(a + b)^2 =$ 47. $(-2y)^4 =$
43. $(3 - x)(1 + 2x) =$ 48. $(3x - 2y)^2 =$
44. Simplify $(-3x^{-3})(2x^{-2})$ 49. Express using positive exponents: $\left(\frac{a^2b}{cd^3}\right)^{-3}$
50. Simplify $(6x^3 + 7x^2 - 8x + 1) - (4x^3 + 7x^2 - 9)$
51. Simplify: $\left(\frac{5}{8}x^3 - \frac{1}{3}x + \frac{1}{2}\right) - \left(-\frac{1}{8}x^3 + \frac{1}{3}x - \frac{1}{2}\right)$

V. Polynomials: Factoring

52. Factor: $2x^3 + 12x^2 - 5x - 30$ 56. Factor: $2x^3 - x^2 + 6x - 3$
53. Factor: $x^2 - 5xy - 14y^2$ 57. Factor: $a^3 + 8a^2 - a - 8$
54. Factor: $3x^2 - 11x + 6$ 58. Factor: $27x^2y^3 - 3x^2y^2 + 12xy^5$
55. Factor: $25a^2 - 4b^2$ 59. Factor: $x^2 - x - 12$

VI. Rational Expressions and Equations

Factor and Simplify

60. $\frac{6x^2 + 11x - 10}{2x + 5}$.

63. $\left(\frac{8x^2}{3y}\right) \left(\frac{15y^2}{2x^2}\right)$

61. $\frac{m^2 - 10m + 25}{m^2 - 25} \cdot \frac{m^2 + 4m - 5}{m^2 - 7m + 10}$

64. Add and simplify: $\frac{d^2}{d - c} + \frac{c^2}{c - d}$

62. $\frac{x + y}{x - y} \div \frac{x^2 + xy}{x^2 - y^2}$

65. $\frac{1}{x + y} + \frac{1}{y + x} =$

Find the LCM:

66. $x, x + 7$

67. $12x^3, 18x^5$

68. $x^2 - 2x, x^2 - 4x + 4$

69. Add and simplify: $\frac{a^2}{a - b} + \frac{b^2}{b - a}$

73. Solve for x : $\frac{5}{x + 2} = \frac{3}{x - 2}$

70. Add and simplify: $\frac{2}{x^2 + x - 6} + \frac{3}{x^2 - 9}$

74. Simplify: $\frac{3 + \frac{2}{x}}{4 + \frac{3}{x}}$

71. Subtract and simplify: $\frac{8x}{16 - x^2} - \frac{5}{x - 4}$

75. Simplify: $\frac{\frac{x}{5y^3} + \frac{3}{10y}}{\frac{3}{10y} + \frac{x}{5y^3}}$

72. Solve for x : $\frac{x + 1}{3} - \frac{x - 1}{2} = 1$

76. Solve for x : $\frac{3}{5} + \frac{3}{x} = \frac{6}{x}$

VII. Systems of Equations

77. What is the solution of the system $x + y = 1$ and $2x - 3y = 7$

78. What is the solution of the system $2x + 3y = 4$ and $3x - 2y = -7$

79. Find two numbers whose sum is 63 and whose difference is 5.

VIII. Radical Expressions and Equations

80. Simplify: $\sqrt{(-4)^2}$

83. Simplify: $\sqrt{9x^2y^4}$

86. Simplify: $\sqrt{125}$

81. Simplify: $\sqrt{81x^5}$

84. Simplify: $\sqrt{289}$

87. Simplify: $\sqrt{12x^9}$

82. Simplify: $\sqrt{x^6}$

85. Simplify: $\sqrt{24}$

88. $7\sqrt{5} - 4\sqrt{5} + 5\sqrt{5} =$

89. Rationalize the denominator: $\sqrt{\frac{3}{200}}$

92. Rationalize the denominator: $\sqrt{\frac{3}{6}}$

90. Rationalize the denominator: $\frac{7}{\sqrt{5}}$

93. Rationalize the denominator of $\frac{4}{2 + \sqrt{3}}$

91. Rationalize the denominator: $\frac{-5}{\sqrt{6} - 1}$

94. A right triangle has the shortest edge 5 and the hypotenuse 9. How long is the third edge?

IX. Quadratic Equations

95. Solve by factoring: $3y^2 - 7y - 20 = 0$

96. Solve by factoring: $3x^2 + 8x = 9 + 2x$

97. If $y(y - 4) = 0$, then $y =$

98. If $(x + 1)(2x - 3) = 0$, then $x =$

Answers

1. 0.625

2. $\frac{7}{9}$

3. $-\frac{7}{3}$

4. $-\frac{11}{36}$

5. $\frac{29}{12}$

6. $-\frac{3}{10}$

7. 0

8. 100.5

9. 5

10. 48

11. $-3x + 6y - 12z$

12. $2x + \frac{7}{3}y$

13. -11

14. $6a + 7b$

15. $\frac{7}{8}$

16. 2.7

17. 15.9

18. 5

19. -5

20. $x < -3$

21. $x \leq 2$

22. $t < -\frac{9}{2}$

23. $6m - 3$

24. $200ft$

25. $w = \frac{P - 2l}{2}$

26. $y = \frac{D - Ax - Cz}{B}$

27. 92

28. (5, 0)

29. (0, -3)

30. $\frac{2}{3}$

31. 0

32. *undefined*

33. 3

34. $-\frac{8}{5}$

35. -26

36. $y = -\frac{2}{5}x - \frac{3}{5}$

37. -1

38. *graph*

39. *graph*

40. $\frac{1}{5^7}$

41. $\frac{b^6}{a^3}$

42. $a^2 + 2ab + b^2$

43. $3 + 5x - 2x^2$

44. $-\frac{6}{x^5}$

45. $4x^2 + 2x + \frac{1}{4}$

46. $4x^2 + x - 3$

47. $16y^4$

48. $9x^2 - 12xy + 4y^2$

49. $\frac{c^3d^9}{a^6b^3}$

50. $2x^3 - 8x + 10$

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

52. $(2x^2 - 5)(x + 6)$

53. $(x - 7y)(x + 2y)$

54. $(3x - 2)(x - 3)$

55. $(5a + 2b)(5a - 2b)$

56. $(x^2 + 3)(2x - 1)$

57. $(a + 1)(a - 1)(a + 8)$

58. $3xy^2(9xy - x + 4y^3)$

59. $(x - 4)(x + 3)$

60. $3x - 2$

61. $\frac{m - 1}{m - 2}$

62. $\frac{x + y}{x}$

63. $20y$

64. $d + c$

65. $\frac{2}{x + y}$

66. $x(x + 7)$

67. $36x^5$

68. $x(x - 2)^2$

69. $a + b$

70. $\frac{5x - 12}{(x - 2)(x - 3)(x + 3)}$

71. $\frac{13x + 20}{(4 - x)(4 + x)}$

72. -1

73. 8

74. $\frac{3x+2}{4x+3}$
75. 1
76. 5
77. $(2, -1)$
78. $(-1, 2)$
79. 34, 29
80. 4
81. $9x^2\sqrt{x}$
82. x^3
83. $3xy^2$
84. 17
85. $2\sqrt{6}$
86. $5\sqrt{5}$
87. $2x^4\sqrt{3x}$
88. $8\sqrt{5}$
89. $\frac{\sqrt{6}}{20}$
90. $\frac{7\sqrt{5}}{5}$
91. $-\sqrt{6} - 1$
92. $\frac{\sqrt{2}}{2}$
93. $4(2 - \sqrt{3})$
94. $2\sqrt{14}$
95. $-\frac{5}{3}, 4$
96. $-3, 1$
97. 0, 4
98. $-1, \frac{3}{2}$