Math 98
Final Exam Review
Spring 2006

This review does not include all topics covered on your Final Exam. However, it will provide a good review of most of the topics. Your exam is 40 multiple choice questions.

In problems 1-3, solve each absolute value equation.

1. $|t+2|=4$

   A. $\{2\}$ B. $\{-6\}$ C. $\{-6,2\}$ D. $\varnothing$

2. $|2d-4|=2$

   A. $\{3\}$ B. $\{1\}$ C. $\{1,3\}$ D. $\varnothing$

3. $\left|7-\frac{1}{2}x\right|=-3$

   A. $\{20\}$ B. $\{8\}$ C. $\{8,20\}$ D. $\varnothing$

In problems 4-6, solve each absolute value inequality.

4. $|x|\geq 9$

   A. $\{x|x\geq 9\}$ B. $\{x|x\leq -9\}$ C. $\{x|x\leq -9 \text{ or } x\geq 9\}$ D. $\{x|-9\leq x\leq 9\}$

5. $|3x-5|\leq 8$

   A. $\left(-\infty,\frac{13}{3}\right]$ B. $\left[-1,\frac{13}{3}\right]$ C. $(-\infty,-1]\cup\left[\frac{13}{3},+\infty\right)$ D. $(-\infty,-1]$

6. $|7-2x|>1$

   A. $(-\infty,3)\cup(4,+\infty)$ B. $(3,4)$ C. $(3,+\infty)$ D. $(-\infty,-3)\cup(4,+\infty)$

7. Find the midpoint between $(-4,3)$ and $(6,-1)$.

   A. $(-10,4)$ B. $(2,2)$ C. $(-5,2)$ D. $(1,1)$

8. Find the midpoint between $(0,-7)$ and $(-5,6)$.

   A. $\left(-\frac{5}{2},-\frac{1}{2}\right)$ B. $\left(\frac{5}{2},-\frac{13}{2}\right)$ C. $(-5,-1)$ D. $(5,13)$

9. Find the length of a rectangular lot with a perimeter of 218 meters if the length is 7 meters more than the width.

   A. 51 meters B. 58 meters C. 65 meters D. 72 meters

10. In 1970, the average teacher's salary at Greenville Academy was $16,000. If the average salary has increased by $900 a year since then, which of the following equations would you use to determine the average salary in t years after 1970? Let S = salary in dollars..

    A. S = 900 + 16000t B. S = 1970 + 900t C. S = 16000 + 900t D. S = 1970 + 16000t

Simplify problems 11-13. Assume that all variables represent positive real numbers.

11. $625^{\frac{3}{4}}$

A. 15 B. 25 C. 125 D. 5

12. $4^{3/5} \cdot 4^{7/5}$

A. 8 B. 16 C. 256 D. 41943.04

13. $\dfrac{16^{-5/4}}{16^{-1/2}}$

A. 8 B. 4 C. $\dfrac{1}{2}$ D. $\dfrac{1}{8}$

In problems 14-17, simplify. Assume all variables represent positive real numbers.

14. $\sqrt[3]{-729}$

A. 9 B. $9i$ C. -9 D. $-9i$

15. $-\sqrt{25a^{16}}$

A. $5a^4$ B. $-5a^4$ C. $5a^8$ D. $-5a^8$

16. $-\sqrt[4]{16x^{12}z^8}$

A. $-2x^3z^2$ B. $2x^3z^2$ C. $4x^3z^2$ D. $-4x^3z^2$

17. $\sqrt{-256}$

A. -16 B. 16 C. $-16i$ D. $16i$

18. The best approximation for $\sqrt[7]{12,516}$ is

A. 3.849 B. 1788 C. 111.875 D. 4.8133×10^{21}

19. $\sqrt{75}-\sqrt{12}+\sqrt{27}=$

A. $\sqrt{60}$ B. $10\sqrt{3}$ C. $2\sqrt{15}$ D. $6\sqrt{3}$

20. $\left(\sqrt{5}-1\right)\left(2\sqrt{5}+7\right)=$

A. $50+5\sqrt{5}$ B. $3-5\sqrt{5}$ C. $17+5\sqrt{5}$ D. $3+5\sqrt{5}$

21. $\left(4\sqrt{3}-6\sqrt{2}\right)^2=$

A. $120-24\sqrt{6}$ B. $120-48\sqrt{6}$ C. 120 D. $48-48\sqrt{6}$

22. $\dfrac{5\sqrt{12}}{10\sqrt{2}}=$

A. $\sqrt{3}$ B. $\dfrac{\sqrt{6}}{2}$ C. 3 D. 12

23. If $f\left(x\right)=x^2-x-5$, then $f\left(-2\right)$ is

A. -11 B. -5 C. -3 D. 1

24. If $g(x) = -x^2 + 3x$, then $g(4)$ is

A. -4 B. 4 C. 28 D. 30

25. $(8+3i)-(6-2i) =$

A. $2-5i$ B. $2-i$ C. $2+5i$ D. $14+i$

26. $3i(5+2i)-4i =$

A. $-6+11i$ B. $-6+4i$ C. $5i$ D. $17i$

27. Find the distance between the points $(3,-4)$ and $(0,7)$.

A. $\sqrt{130}$ B. $\sqrt{31}$ C. $\sqrt{14}$ D. $3\sqrt{2}$

28. Find the distance between the points $(-1,-5)$ and $(2,-6)$.

A. $\sqrt{2}$ B. $\sqrt{10}$ C. $\sqrt{122}$ D. $\sqrt{130}$

In problems 29-42, solve each equation.

29. $3a^2 - 26a = 9$

A. $\left\{\frac{1}{3}, 9\right\}$ B. $\left\{-9, -\frac{1}{3}\right\}$ C. $\left\{-9, \frac{1}{3}\right\}$ D. $\left\{-\frac{1}{3}, 9\right\}$

30. $21y^2 = y + 10$

A. $\left\{\frac{2}{3}, \frac{5}{7}\right\}$ B. $\left\{-\frac{5}{7}, -\frac{2}{3}\right\}$ C. $\left\{-\frac{5}{7}, \frac{2}{3}\right\}$ D. $\left\{-\frac{2}{3}, \frac{5}{7}\right\}$

31. $q^2 - 9q = 0$

A. $\{0, 9\}$ B. $\{0, -9\}$ C. $\{-3, 3\}$ D. $\{0, 3\}$

32. $9y^3 = y$

A. $\left\{-\frac{1}{3}, 0, \frac{1}{3}\right\}$ B. $\{-3, 0, 3\}$ C. $\left\{0, \frac{1}{3}\right\}$ D. $\left\{\pm\frac{1}{3}\right\}$

33. $w^2 = 128$

A. $\left\{\pm 2\sqrt{8}\right\}$ B. $\left\{\pm 8\sqrt{2}\right\}$ C. $\left\{\pm 8\sqrt{3}\right\}$ D. $\left\{\pm 4\sqrt{5}\right\}$

34. $(2m+3)^2 = 7$

A. $\left\{\frac{-3 \pm \sqrt{7}}{2}\right\}$ B. $\left\{\frac{3 \pm \sqrt{7}}{2}\right\}$ C. $\left\{\frac{2 \pm \sqrt{7}}{3}\right\}$ D. $\left\{\frac{-2 \pm \sqrt{7}}{3}\right\}$

35. $3q^2 = 4q - 2$

A. $\left\{\frac{2}{3} \pm \frac{2\sqrt{2}}{3}i\right\}$ B. $\left\{\frac{2}{3} \pm \frac{\sqrt{2}}{3}i\right\}$ C. $\left\{\frac{2}{3} \pm \frac{\sqrt{2}}{3}\right\}$ D. $\left\{\frac{4}{3} \pm \frac{\sqrt{2}}{3}i\right\}$

36. $5x^2 - x = 1$

A. $\left\{\frac{1}{10} \pm \frac{\sqrt{19}}{10}\right\}$ B. $\left\{-\frac{1}{10} \pm \frac{\sqrt{19}}{10}i\right\}$ C. $\left\{\frac{1}{10} \pm \frac{\sqrt{21}}{10}i\right\}$ D. $\left\{\frac{1}{10} \pm \frac{\sqrt{21}}{10}\right\}$

37. $\frac{x}{2} - \frac{4}{x} = -\frac{7}{2}$

A. $\{-1, 8\}$ B. $\{-8\}$ C. $\{-8, 1\}$ D. $\varnothing$

38. $\frac{x-4}{x-3} + \frac{x-2}{x-3} = x - 3$

A. $\{3, 5\}$ B. $\{5\}$ C. $\{-1, 3\}$ D. $\left\{1 \pm i\sqrt{14}\right\}$

39. $\sqrt{m^2 + 5m - 8} = m + 1$

A. $\{3\}$ B. $\left\{\frac{9}{5}\right\}$ C. $\{-3\}$ D. $\{2\}$

40. $\sqrt{x+6} = x$

A. $\{-2, 3\}$ B. $\{-2\}$ C. $\{3\}$ D. $\varnothing$

41. $\sqrt{2x+13} + x = 1$

A. $\{-6, 2\}$ B. $\{-2\}$ C. $\{-2, 6\}$ D. $\varnothing$

42. $x^4 + 9x^2 + 20 = 0$

A. $\left\{\pm 2, \pm\sqrt{5}\right\}$ B. $\left\{\pm 4, \pm\sqrt{5}\right\}$ C. $\{\pm 2, \pm 5\}$ D. $\left\{\pm 2i, \pm i\sqrt{5}\right\}$

43. Approximate the solutions of this quadratic equation to four decimal places: $2x^2 - 7x + 1 = 0$

A. $\{0.1492, 3.3508\}$ B. $\{-3.3508, -0.1492\}$

C. $\{-4.6531, 8.1531\}$ D. $\{0.0729, 3.4271\}$

44. Calculate the term that must be added to this binomial to make it a perfect trinomial square: $x^2 + 5x$

A. $\frac{5}{2}$ B. $\frac{1}{2}$ C. 25 D. $\frac{25}{4}$

45. Use the discriminant to predict the number and type of solutions for this quadratic equation: $9k^2 = 12k - 4$

A. 2 real rational B. 2 real irrational C. 2 imaginary D. 1 real rational

46. A dog pen is in the shape of a right triangle. The longer leg measures 15 feet. The hypotenuse is 7 feet shorter than three times the length of the shorter leg. How long is the shorter leg?

A. $2\frac{3}{4}$ feet B. 8 feet C. 17 feet D. 64 feet

47. The vertex of the parabola $y = (x-1)^2 + 3$ is

A. $(1, 3)$ B. $(-1, 3)$ C. $(1, -3)$ D. $(-1, -3)$

48. The vertex of the quadratic function $f(x)=2x^2-6x+3$ is

A. $\left(-\frac{3}{2},\frac{33}{2}\right)$ B. $\left(\frac{3}{2},-\frac{3}{2}\right)$ C. $(3,3)$ D. $(-3,39)$

49. A bottle rocket is launched upward from the ground with an initial velocity of 64 ft. per second. The rocket's height measured in feet above the ground is given by $h(t)=64t-16t^2$ where *t* is the number of seconds after launch. When does the rocket hit the ground?

A. 1 second B. 4 seconds C. 16 seconds D. 64 seconds

In problems 50-52, solve each inequality.

50. $4x^2+7x<15$

A. $\left(-3,\frac{5}{4}\right)$ B. $\left[-3,\frac{5}{4}\right]$ C. $(-\infty,-3)\cup\left(\frac{5}{4},+\infty\right)$ D. $(-\infty,-3]\cup\left[\frac{5}{4},+\infty\right)$

51. $6x^2+10\geq 19x$

A. $\left[\frac{2}{3},\frac{5}{2}\right]$ B. $\left(-\infty,\frac{2}{3}\right]\cup\left[\frac{5}{2},+\infty\right)$ C. $\left(\frac{2}{3},\frac{5}{2}\right)$ D. $\left(-\infty,\frac{2}{3}\right)\cup\left(\frac{5}{2},+\infty\right)$

52. $(x-4)(x+1)(x-9)\geq 0$

A. $[-9,-4]\cup[1,+\infty)$ B. $(-\infty,-9]\cup[-4,1]$

C. $[-1,4]\cup[9,+\infty)$ D. $(-\infty,-1]\cup[4,9]$

53. Find the slope of the line through $(-2,5)$ and $(-3,-1)$.

A. 6 B. $\frac{1}{6}$ C. $-\frac{1}{6}$ D. -6

54. The slope of $5x+2y=1$ is

A. $\frac{2}{5}$ B. $-\frac{2}{5}$ C. $\frac{5}{2}$ D. $-\frac{5}{2}$

55. Which of the following equations is in slope-intercept form?

A. $y-3=\frac{2}{5}(x-1)$ B. $y=\frac{2}{5}x+\frac{13}{5}$ C. $2x-5y=-13$ D. none of these

56. Determine which of the following points will lie on the line through the points $(-22,2)$ and $(0,4)$.

A. $(0,-3)$ B. $(11,-6)$ C. $(44,8)$ D. $(66,-2)$

57. $5x-10y=1$ and $3y+1=6x$ are

A. parallel lines B. perpendicular lines C. neither

58. $1-4x=10y$ and $15x=6y+1$ are

A. parallel lines B. perpendicular lines C. neither

In problems 59-63, find an equation that represents each line and write the equation in standard form.

59. $m=-4$ and through $(-1,-5)$

A. $4x+y=-9$ B. $4x-y=-9$ C. $4x+y=9$ D. $4x-y=9$

60. $m=-\frac{4}{7}$ and through $(-6,-14)$

A. $4x+7y=-122$ B. $4x+7y=122$ C. $4x-7y=122$ D. $4x-7y=-122$

61. Through $(-7,3)$ and $(-3,-3)$

A. $x=-7$ B. $3x+2y=-15$ C. $2x+3y=-15$ D. $3x+2y=5$

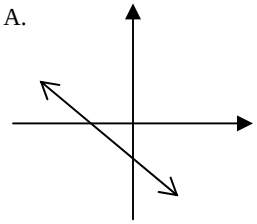
62. Vertical and through $(-9,2)$

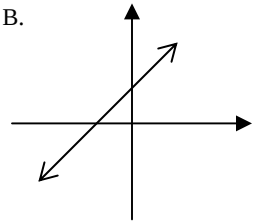
A. $y=2$ B. $x=2$ C. $y=-9$ D. $x=-9$

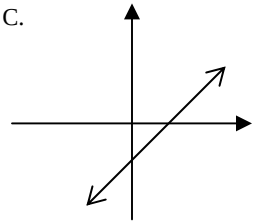
63. Perpendicular to $-x+3y=2$ and through $(7,-4)$

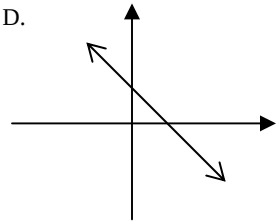
A. $3x+y=17$ B. $3x-y=25$ C. $x-3y=19$ D. $x+3y=-5$

64. The graph that best represents $3x+2y=4$ is

A. 

B. 

C. 

D. 

65. In the solution to the system $\begin{cases}-5x+2y=23\\3x+2y=-1\end{cases}$, the x-coordinate is

A. 4 B. 3 C. -3 D. -4

66. The solution set for the system $\begin{cases}9x-12y=1\\-3x+4y=27\end{cases}$ is

A. $\left(\frac{1}{9},0\right)$ B. $\left(0,\frac{27}{4}\right)$ C. $\{(x,y)|9x-12y=1\}$ D. $\varnothing$

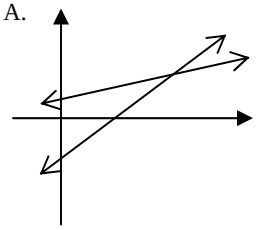
67. The system $\begin{cases}4x+2y=1\\6x+3y=5\end{cases}$ has how many solutions?

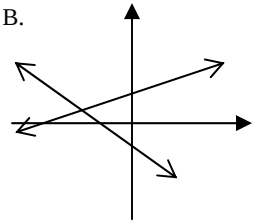
A. 2 B. 1 C. 0 D. an infinite number

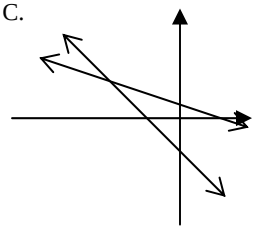
68. Tomeka purchased 3 cans of green beans and 2 cans of corn for \$2.44. Sandra purchased 5 cans of green beans and 6 cans of corn for \$5.64 at the same store. What was the cost of a can of beans?

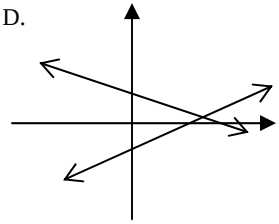
A. \$1.68 B. \$0.59 C. \$0.42 D. \$0.21

69. The graph that could be used to find the solution to the system $\begin{cases}5x-4y=9\\x-2y=-3\end{cases}$ is

A. 

B. 

C. 

D. 

70. The two solutions to the equation $-x^2+5x+1=0$ are

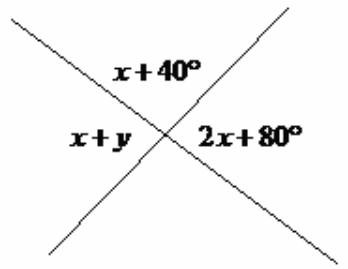
A. both imaginary B. both real C. 1 real, 1 imaginary D. both the same number

71. Grace has 80 coins all worth $11, and all consisting of only dimes and quarters. How many dimes must Grace have?

A. 1100 B. 60 C. 20 D. cannot be determined

72. Find the value of y in this figure:

A. 100°
B. 60°
C. 20°
D. 120°



73. A total of 3000 people watched a popular movie. Twice as many adults as children were in attendance. How many adults watched the movie?

A. 1000 B. 2000 C. 1500 D. 6000

74. Simplify $\sqrt[3]{2x^2}\cdot\sqrt[3]{4x}$

A. $2\sqrt[3]{x^2}$ B. $8x$ C. $\sqrt[3]{8x}$ D. $2x$

75. Which of the following best describes the shape of the graph of this function?

$y=-5(x-4)^2+10$

A. The y-intercept is the point (0, 10).
B. The graph does not cross the x-axis.
C. The graph is a straight line.
D. The graph opens downward.

76. Simplify: $(3-2i)^2$

A. 13 B. 13 – 12i C. 5 – 12i D. 5

77. Simplify: $\sqrt{450y^9}$

A. $30y^4\sqrt{5y}$ B. $15y^4\sqrt{2y}$ C. $2y^4\sqrt{15y}$ D. $15y^3\sqrt{2}$

Solve the equations for questions 78-81.

78. $(6-2x)^2+4=0$

A. { 3 ± i } B. { 2,4 } C { -3 ± i} D. { 2 }

79. $k^2-4k=6$

A. $\{2\pm\sqrt{6}\}$ B. { 10, 14} C. $\{-2\pm\sqrt{10}\}$ D. $\{2\pm\sqrt{10}\}$

80. $2x^2-x-3=0$

A. $\{-1, -\frac{3}{2}\}$ B. $\{-1, \frac{3}{2}\}$ C. $\{1, \frac{3}{2}\}$ D. $\{1, -\frac{3}{2}\}$

81. $-6x^2 + 10x = 3$

A. $\{ \frac{5}{6} \pm \frac{\sqrt{7}}{6} \}$ B. $\{ \frac{5}{6} \pm \frac{\sqrt{7}}{6} i \}$ C. $\{ -\frac{5}{6} \pm \frac{\sqrt{7}}{6} \}$ D. $\{ -\frac{5}{6} \pm \frac{\sqrt{7}}{6} i \}$

For questions 82-83, find the slope and the y-intercept. Let m = slope and (0,b) = y-intercept.

82. $x = -3$

A. Slope undefined, no y-intercept
B. Slope undefined, b = -4
C. m = 0, no y-intercept
D. m = 0, b = -3

83. $y - 4 = 0$

A. Slope undefined, no y-intercept
B. Slope undefined, b = -4
C. m = 0, no y-intercept
D. m = 0, b = 4

84. Which statement is true for the solution of this system of equations?

$$\begin{cases} 8x - 7y = 19 \\ 9x - 2y = -8 \end{cases}$$

A. The x-coordinate is 2. B. The y-coordinate is 2. C. The y-coordinate is –2. D. The x-coordinate is –2.

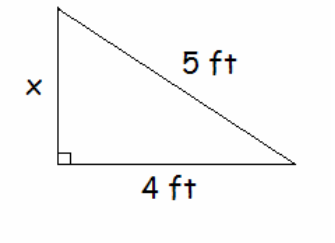
85. Which state is true about this system of equations?

$$\begin{cases} 3x - 4y = 1 \\ -6x + 8y = -2 \end{cases}$$

A. There are only two solutions.
B. There is only one solution.
C. There are infinitely many solutions.
D. There are no solutions.

86. Find the perimeter of the triangle at the right.

A. 5 feet
B. 12 feet
C. 6 feet
D. 18 feet



Answers to the Math 98 Exam Review (Spring 2006)

1. C
2. C
3. D
4. C
5. B
6. A
7. D
8. A
9. B
10. C
11. C
12. B
13. D
14. C
15. D
16. A
17. D
18. A
19. D
20. D
21. B
22. B
23. D
24. A
25. C
26. A
27. A
28. B
29. D
30. D
31. A
32. A
33. B
34. A
35. B
36. D
37. C
38. B
39. A
40. C
41. B
42. D
43. A
44. D
45. D
46. B
47. A
48. B
49. B
50. A
51. B
52. C
53. A
54. D
55. B
56. C
57. C
58. B
59. A
60. A
61. B
62. D
63. A
64. D
65. C
66. D
67. C
68. C
69. A
70. B
71. B
72. A
73. B
74. D
75. D
76. C
77. B
78. A
79. D
80. B
81. A
82. A
83. D
84. D
85. C
86. B