Math 120 Review
Version 2

Multiple Choice Format
Revised 4/25/2008

Problems 1-7 solve:

1. $x^2 - 6x = 16$

a. -8, -2 b. 2, 8 c. -8, 2 d. -2, 8

2. $x(x-8) = 48$

a. -8, 6 b. -6, 8 c. -12, 4 d. -4, 12

3. $3x^2 - 10x = 8$

a. -4, 12 b. $-\frac{2}{3}, 4$ c. -4, $\frac{2}{3}$ d. 8,8

4. $\frac{21}{x} - \frac{21}{x-4} = -4$

a. -4, 12 b. -12, 4 c. -7, 3 d. -3, 7

5. $9x^4 - 24x^2 + 16 = 0$

a. $\pm\frac{2}{\sqrt{3}}$ b. $\frac{2}{\sqrt{3}}$ c. 0, $\pm\frac{2}{\sqrt{3}}$ d. $\frac{4}{3}$

6. $\sqrt{2x+3} = 1 - \sqrt{x+1}$

a. 3 b. -1 c. 3, -1 d. No solution

7. $|3x+10| = 13$

a. 1 b. 1, -1 c. 1, $-\frac{23}{3}$ d. 1, $\frac{23}{3}$

Problems 8 and 9, simplify and put all answers in the form a + bi.

8. $(16+2i)-(3+4i^2)$

a. $9+2i$ b. $13-2i$ c. $15+2i$ d. $17+2i$

9. $\dfrac{-4+i}{1+4i}$

a. $\dfrac{8}{-17}+i$ b. $-i$ c. i d. $\dfrac{8}{17}-i$

10. Determine which equation represents y as a function of x:

a. $x^2+2x-y+3=0$ b. $y^2+2x+4=0$ c. $|y|-x=1$
d. $x^2+y^2=25$

For problems 11-15, match the given equation to its corresponding graph.

11. $y=-2x^2+3x-4$

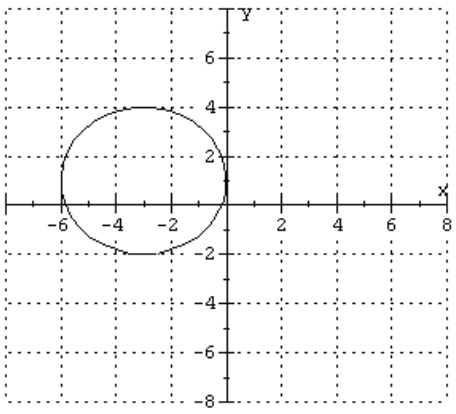
12. $y=x^4-3x^3+2x-1$

13. $y=3x+2$

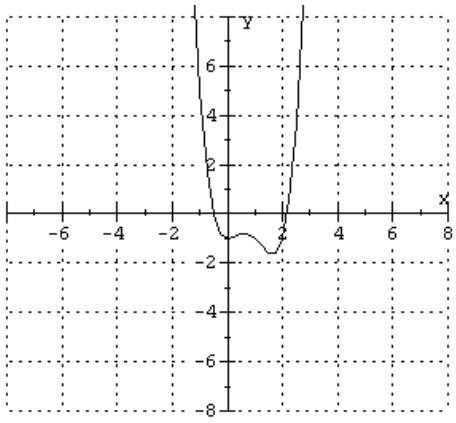
14. $(x+3)^2+(y-1)^2=9$

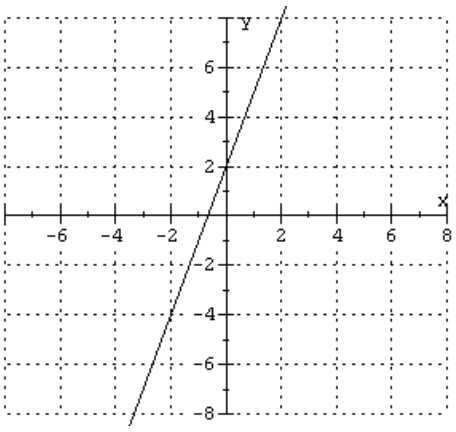
15. $y=x^3+2x^2-5$

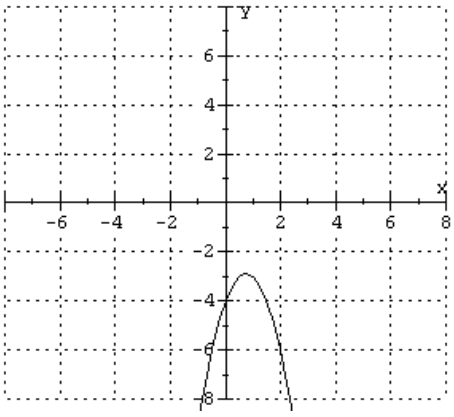
a.

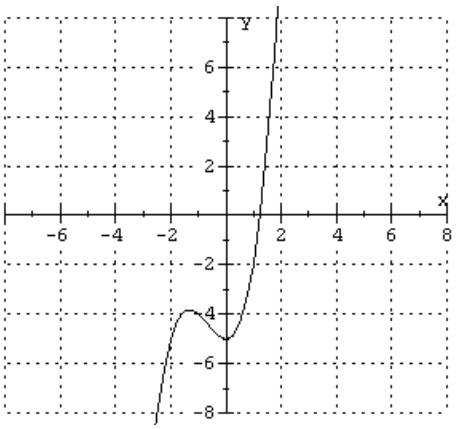


b.

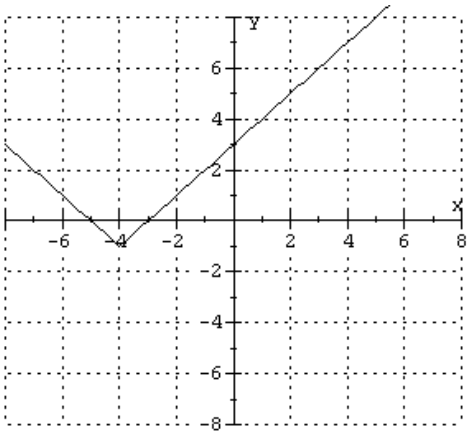


c. 

d. 

e. 

16. The graph below is a transformation of the graph of $f(x)=|x|$. Find the equation for the function.



a. $g(x)=|x-1|-4$ b. $g(x)=|x-4|-1$ c. $g(x)=|x-1|+4$

d. $g(x)=|x+4|-1$

17. Find the domain: $f(x)=\sqrt{2x+3}$

a. $[0,\infty)$ b. $(0,\infty)$ c. $\left[-\frac{3}{2},\infty\right)$ d. $\left(-\frac{3}{2},\infty\right)$

18. Find the domain: $f(x)=\frac{1}{x^2-3x+2}$

a. $(-\infty,-2)\cup(-2,1)\cup(1,\infty)$ b. $(-\infty,1)\cup(1,2)\cup(2,\infty)$ c. $(-\infty,\infty)$
d. $(-\infty,-1)\cup(-1,\infty)$

19. Find the domain: $f(x)=\ln(3x+1)$

a. $(-\infty,\infty)$ b. $\left(-\frac{1}{3},\infty\right)$ c. $(0,\infty)$ d. $\left(\frac{1}{3},\infty\right)$

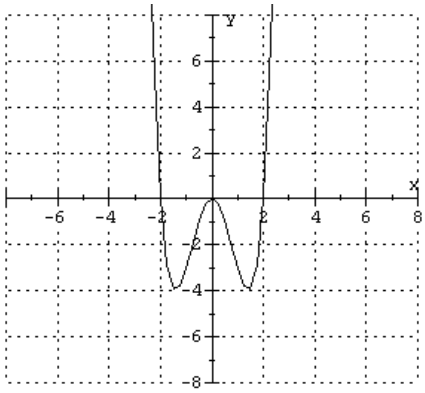
20. Find the domain: $f\left(x\right)=\frac{x}{x^2+1}$

a. $(-\infty,1)\cup(1,\infty)$ b. $(-\infty,-1)\cup(-1,\infty)$ c. $(-\infty,0)\cup(0,\infty)$ d. $(-\infty,\infty)$

21. Given $f(x)=x^2+3$ and $g(x)=x-1$, find $(f/g)(-1)$

a. 2 b. 0 c. -2 d. undefined

22. From the graph, determine where $f(x)\geq 0$



a. [-2, 2] b. $(-\infty,-2]\cup[2,\infty)$ c. $(-1,0]\cup[1,\infty)$ d. $(-\infty,-1]\cup[0,1]$

23. Determine if the function is even or odd: $f(x) = 2x^3 + 3x^2$

a. Odd b. Even c. Both d. Neither

24. Determine if the function is even or odd: $f(x) = 4x^3 + 3x$

a. Even b. Odd c. Both d. Neither

25. List the possible rational zeros of the function $f(x) = 3x^5 - 2x^3 + 3x - 5$

a. $\pm\frac{5}{3},\ \pm 3,\ \pm\frac{1}{3},\ \pm 5,\ \pm 1,\ \pm\frac{1}{5},\ \pm\frac{5}{3}$

b. $\pm\frac{3}{5},\ \pm 1,\ \pm\frac{1}{5},\ \pm 3$

c. $\pm\frac{1}{3},\ \pm 1,\ \pm\frac{5}{3},\ \pm 5$

d. $\pm 1,\ \pm 3,\ \pm\frac{3}{5},\ \pm\frac{5}{3}$

26. Find all the real zeros of $f(x) = 2x^3 + 14x^2 + 24x$

a. 0, 3, 4 b. 3, 4 c. -4, -3, 0 d. 0, 1, 6

27. Determine the left-hand and right-hand behavior of the graph of $y = -x^5 + 2x^2 - 1$

a. Up to the left, down to the right

b. Down to the left, up to the right

c. Up to the left, up to the right

d. Down to the left, down to the right

28. V varies directly with the cube of P and inversely with Q. If V = 2 when P = 2 and Q = 8, find V when P = 1 and Q = 2.

a. 4 b. 2 c. 1 d. $\frac{1}{2}$

29. Find the center and radius of the circle: $(x+4)^2 + (y-1)^2 = 36$

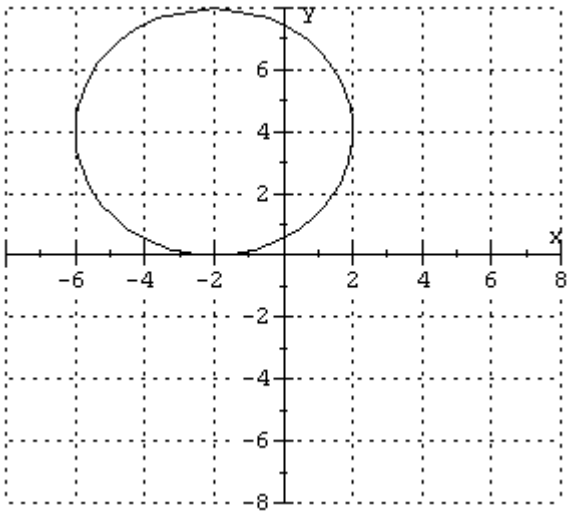
a. center: (-4, 1), radius 36

b. center: (4, -1), radius 36

c. center: (-4, 1), radius 6

d. center: (4, -1), radius 6

30. Find the center and radius of the circle:



a. center (-2, 4), radius 4 b. center (-2, -4), radius 4

c. center (-2, -4), radius 2 d. center (-2, -4), radius 2

31. Determine how many solutions the system has and solve:

$$\begin{cases} x^2 + 2y = 6 \\ 2x + y = 3 \end{cases}$$

a. (4, -5) b. (2,1) c. (0,3) d. (0,3) and (4, -5)

32. Write in standard form: $y = 2x^2 + 16x + 9$

a. $y = 2(x+4)^2 - 7$ b. $y = 2(x+2)^2 + 5$ c. $y = 2(x+4)^2 - 23$

d. $y = 2(x+8)^2 + 73$

33. Divide: $\left(x^3 - 5x + 12\right) \div \left(x + 3\right)$

a. $x^2 - 3x + 4$ b. $x^2 + 3x - 4$ c. $x^2 + 3x + 4$ d. $x^2 - 3x - 4$

34. Find the vertical asymptote(s), if any, for $f(x)=\dfrac{4x-5}{x^2+x-2}$

a. x = 4, x = -2 b. x = -2, x = 1, x = 4 c. x = -2, x = 1
d. No vertical asymptote

35. Find the horizontal asymptote(s) , if any, for $f(x)=\dfrac{2x^2-1}{x^2+3}$

a. x = 2 b. $y=\dfrac{1}{2}$ c. y = 2 d. No horizontal asymptote

36. Find the quadratic function whose graph opens downward and has x intercepts at (2, 0) and (-3, 0).

a. $y=6-x^2$ b. $y=6+x-x^2$ c. $y=6-x-x^2$

d. $y=x^3+12x^2+36x$

37. Find the equation of a line that is perpendicular to the line 2x +3y = 12 but has the same y intercept.

a. 2x +y = 8 b. 2x – 3y = 12 c. 2x+ 3y = -12 d. 3x – 2y = -8

38. Identify the types of symmetry: $x^4y^2+2x^2y-1=0$

a. x-axis b. y-axis c. origin d. none

39. Write as a single log expression: $\log_2(x-2)+\log_2(x+2)$

a. $-2+2\log_2 x$ b. $\log_2(x^2-4)$ c. $2\log_2 x$ d. $\log_2 2x$

40. Expand: $\log\sqrt[3]{\dfrac{a^2b}{c}}$

a. $\sqrt[3]{\dfrac{2\log a+\log b}{\log c}}$ b. $\dfrac{1}{3}\left(\dfrac{2\log a+\log b}{\log c}\right)$ c. $\dfrac{1}{3}(2\log a+\log b-\log c)$
d.. None of the above

41. Simplify: $\log_a a^3$

a. a^3 b. 3a c. 3 d. None of the above

42. Simplify: $\ln e^{1-x}$

a. e^{1-x} b. e c. $1-x$ d. $\ln(1-x)$

43. Solve $3^{5x+1}=5$. Round the answer to 4 decimal places.

a. 0.1022 b. 0.0930 c. 0.1333 d. 0.2218

44. $\log(3x+7)+\log(x-2)=1$

a. $\frac{8}{3}$ b. $3,-\frac{8}{3}$ c. 2 d. $2,-\frac{5}{3}$

45. Write in exponential form: $\log_b 37=2$

a. $37^2=b$ b. $2^b=37$ c. b = 10 d. $b^2=37$

46. Determine the principle that must be invested at a rate of 9% compounded monthly so that the balance in 20 years will be $35,000.

a. $12,500.00 b. $9,470.00 c. $6914.23 d. $5,824.45

47. The number of bacteria N in a culture is modeled by $N=150e^{kt}$ where t is the time in hours. If N = 375 when t = 3, what is the time required for the original population to triple in size?

a. 3.60 hours b. 5.28 hours. c. 9.00 hours d. 9.91 hours

48. World population has been growing exponentially for the past 30 years. In 1987, the world population was 5 billion. In 1998, it was 6 billion. Use this information and an exponential growth model to find the time (to the nearest year) that the population would take to double.

a) 22 years b) 42 years c) 20 years d) None of these

49. Find the inverse of the function: $f(x)=\frac{2}{3x+1}$

a. $\frac{3x-1}{2}$ b. $\frac{2-x}{3x}$ c. $\frac{3x+1}{2}$ d. $\frac{1-x}{2}$

50. Find the solution to the system of linear equations with the augmented matrix:

$$\left[\begin{array}{ccc:c} 1 & 0 & 1 & 0 \\ 0 & 1 & -2 & 1 \end{array}\right]$$

a. (a, 1 + a, -a) b. (–a, 2a + 1, a) c. (a, 1 – 2a, a) d. (-a, 1 – 2a, a)

Math 120 Review
Version 2
Answer Key

1. d
2. d
3. b
4. d
5. a
6. b
7. c
8. d
9. c
10. a
11. d
12. b
13. c
14. a
15. e
16. d
17. c
18. b
19. b
20. d
21. c
22. b
23. d
24. b
25. c
26. c
27. a
28. c
29. c
30. a
31. d
32. c
33. a
34. c
35. c
36. c
37. d
38. b
39. b
40. c
41. c
42. c
43. b
44. a
45. d
46. d
47. a
48. b
49. b
50. b