MA 152 PRACTICE QUESTIONS FOR THE FINAL 1/04

1. Find the distance between $P(4,-3)$ and $Q(2,1)$.
   A. 20 B. $2\sqrt{5}$ C. $2\sqrt{10}$ D. 40 E. $\sqrt{6}$

2. The slope of a line passing through the two points $(1,3)$ and $(3,-2)$ is
   A. $\frac{1}{4}$ B. $\frac{1}{2}$ C. $-\frac{2}{5}$ D. -2 E. None of the above.

3. $(\frac{1}{2}x-5)^2 =$
   A. $\frac{1}{4}x^2+5x-25$ B. $\frac{1}{4}x^2-5x+25$ C. $\frac{1}{4}x^2-\frac{5}{2}x-25$ D. $\frac{1}{4}x^2-\frac{5}{2}x+25$
   E. None of the above.

4. The slope of a line perpendicular to the line with the equation $3x-5y+4=0$ is
   A. $-\frac{3}{5}$ B. $\frac{3}{5}$ C. $\frac{5}{3}$ D. $-\frac{5}{3}$ E. None of the above.

5. Solve for x: $\frac{1}{3}x-1=\frac{1}{5}x+2$.
   A. $x=\frac{45}{2}$ B. $x=\frac{2}{15}$ C. $x=\frac{2}{5}$ D. $x=\frac{15}{2}$ E. There are no solutions.

6. Solve for x: $\sqrt{3x+7}=8$.
   A. $x=\frac{1}{3}$ B. $x=5$ C. $x=57$ D. $x=\sqrt{3}$ E. None of the above.

7. Solve the inequality $3x-7>5x+6$.
   A. $x<-\frac{13}{2}$ B. $x>-\frac{13}{2}$ C. $x<-\frac{1}{2}$ D. $x>-\frac{1}{2}$ E. None of the above.

8. Solve: $|3x-7|\geq 5$. Express the solution using interval notation.
   A. $(-\infty,-\frac{2}{3}]\cup[4,\infty)$ B. $[\frac{2}{3},\infty)$ C. $(-\infty,-4]\cup[\frac{2}{3},\infty)$ D. $[-4,\infty)$ E. $(-\infty,\frac{2}{3}]\cup[4,\infty)$

9. If y varies inversely as x and $y=18$ when $x=6$, find x when $y=2$.
   A. 54 B. $\frac{1}{54}$ C. $\frac{2}{3}$ D. $\frac{3}{2}$ E. None of the above.

10. Simplify $\left(\dfrac{a^2b^{-3}}{a^{-3}b^2}\right)^{-2}$
    A. $\frac{b}{a}$ B. $(\frac{a}{b})^2$ C. $(\frac{a}{b})^6$ D. $(\frac{b}{a})^{10}$ E. None of the above.

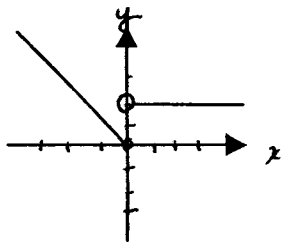
11. Divide and simplify $\dfrac{x^2-2x+1}{x^2-1}\div\dfrac{x^2-3x+2}{x-2}$.
    A. $\dfrac{(x-1)^2}{x+1}$ B. $\dfrac{1}{x+1}$ C. $\dfrac{x-2}{(x+1)(x+2)}$ D. 1 E. None of the above.

12. Factor: $16x^2-4y^8$
    A. $(4x-y^2)(4x+y^2)$ B. $(4x-2y^4)^2$ C. $4(2x-y^4)(2x+y^4)$ D. $4(2x-y^2)$ E. None of the above.

13. Find the symmetries, if any, of the graph of $y=2x^2+1$.
    A. about the y-axis B. about the x-axis C. about the origin D. about the y-axis and the origin E. about the x-axis and the origin

14. The equation for the circle with center $(-3,2)$ and radius 5 is:
    A. $(x-3)^2+(y+2)^2=25$ B. $(x+3)^2+(y-2)^2=25$ C. $(x-3)^2+(y-2)^2=5$
    D. $(x-3)^2+(y+2)^2=5$ E. None of the above.

15. The graph at the right can best be described by which piecewise function?



A. $f(x) = \begin{cases} x & x \le 0 \\ x+2 & x > 0 \end{cases}$ B. $f(x) = \begin{cases} -x & x \le 0 \\ 2x & x > 0 \end{cases}$

C. $f(x) = \begin{cases} x-1 & x \le 0 \\ 2x & x > 0 \end{cases}$ D. $f(x) = \begin{cases} -x & x \le 0 \\ 2 & x > 0 \end{cases}$

E. None of the above.

16. Solve the system of equations for x : $3x + y = -1$, $x + 2y = 3$.
A. $x = -2$ B. $x = 2$ C. $x = 1$ D. $x = -1$ E. None of the above.

17. Solve for x : $2x^2 - 3x = 2$.
A. $-\frac{1}{2}$, -2 B. $-\frac{3}{2}$, 2 C. $\frac{3}{2}$, 2 D. $\frac{1}{2}$, -2 E. None of the above.

18. Solve for x : $\dfrac{1}{x-4} - \dfrac{1}{x-2} = \dfrac{1}{4}$.
A. $x = 4$, $x = 2$ B. $x = 0$, $x = 2$ C. $x = 0$, $x = 6$ D. $x = 6$, $x = 4$ E. None of the above.

19. Rationalize the denominator: $\dfrac{2}{\sqrt{x} - 5}$.
A. $\dfrac{2(\sqrt{x}-5)}{x+25}$ B. $\dfrac{2(\sqrt{x}-5)}{x+5}$ C. $\dfrac{2(\sqrt{x}+5)}{x-25}$ D. $\dfrac{2(\sqrt{x}+5)}{x-5}$ E. None of the above.

20. Multiply and simplify completely: $(3i - 2)(2i - 5)$.
A. $4 + 19i$ B. $-16 - 19i$ C. $4 - 19i$ D. $-16 + 19i$ E. None of the above.

21. Give the equation of the line in slope-intercept form which is parallel to the line $2x - 3y = 7$ and contains the point $(2, -3)$.
A. $y = -\frac{3}{2}x$ B. $y = -\frac{2}{3}x - \frac{5}{3}$ C. $y = \frac{2}{3}x - \frac{13}{3}$ D. $y = \frac{2}{3}x + \frac{5}{3}$ E. None of the above.

22. One solution of $2x^2 + 2x - 1 = 0$ is
A. $-1 - \sqrt{3}$ B. $-2 - \frac{1}{2}\sqrt{3}$ C. $-2 - \sqrt{3}$ D. $\frac{1}{2} - \frac{1}{2}\sqrt{3}$ E. $-\frac{1}{2} - \frac{1}{2}\sqrt{3}$

23. For $f(x) = \dfrac{8}{x-4}$ find $f(-2)$.
A. -4 B. $\frac{8}{6}$ C. $-\frac{4}{3}$ D. -2 E. None of the above.

24. Let $f(x) = 4 - x$ and $g(x) = x^2 + 1$. Find $(f \cdot g)(5)$.
A. 26 B. 234 C. -22 D. 2 E. None of the above.

25. For a one-to-one function, f, given by $f(x) = \dfrac{1}{x+3}$, determine f^{-1}.
A. $f^{-1}(x) = \dfrac{1-3x}{x}$ B. $f^{-1}(x) = \dfrac{1}{3-x}$ C. $f^{-1}(x) = \dfrac{3-x}{1}$ D. $f^{-1}(x) = \dfrac{x+1}{3}$ E. None of the above.

26. Express in terms of $\log x$, $\log y$ and $\log z$: $\log \sqrt{\dfrac{z^3}{xy}}$.

A. $\left(\dfrac{3\log z}{(\log x)(\log y)}\right)^{1/2}$ B. $\frac{3}{2}\log z - \frac{1}{2}\log x - \frac{1}{2}\log y$ C. $(3\log z - \log x - \log y)^{1/2}$

D. $\frac{1}{2}\dfrac{3\log z}{(\log x)(\log y)}$ E. $\frac{3}{2}\log z - \frac{3}{2}\log x + \frac{3}{2}\log y$

27. $(\frac{1}{8})^{-2/3} =$

A. $\frac{1}{4}$ B. 4 C. $16\sqrt{2}$ D. $\dfrac{1}{16\sqrt{2}}$ E. None of the above.

28. Express as a single logarithm and simplify: $\log_a 7 - \log_a 20 + 2\log_a 4$.
A. $\log_a(\frac{28}{5})$ B. $\log_a 3$ C. $\log_a(\frac{7}{10})$ D. $\log_a 6$ E. None of the above.

29. $\log_2(\frac{1}{16}) =$
A. $\frac{1}{4}$ B. $-\frac{1}{4}$ C. 4 D. -4 E. None of the above.

30. If $2^{x+1} = 3$, then find x. (Give your answer correct to 2 decimal places.)
A. 0.41 B. 0.50 C. 0.56 D. 0.60 E. 0.58

31. Paul can paint a room in 5 hours. Sally can paint the same room in 3 hours. How long will it take for them to paint the room if they work together?
A. 4 hours B. $1\frac{7}{8}$ hours C. 3 hours D. $\frac{8}{15}$ hours E. None of the above.

32. The base of a triangle is 5 inches less than its altitude. The area is 18 square inches. Find the base of the triangle.
A. 9 inches B. 6 inches C. 4 inches D. 34 inches E. None of the above.

33. At 2:00 P.M. two cars start toward each other from towns 240 miles apart. If the rate of one car is 10 mph faster than the other, find the rate of the faster car if the two cars meet at 5:00 P.M.
A. 45 mph B. 35 mph C. 40 mph D. 30 mph E. None of the above.

34. Two investments are made totaling \$4800. Part of the money is invested at 8% and the rest at 9%. In the first year they yield \$412 in simple interest. How much money is invested at 8%?
A. \$1820 B. \$2980 C. \$2600 D. \$2000 E. None of the above.

35. A truck enters a freeway traveling 40 mph. One hour later a car enters the same freeway traveling 55 mph. After how many miles will the car overtake the truck?
A. $146\frac{2}{3}$ miles B. $201\frac{2}{3}$ miles C. 120 miles D. $106\frac{2}{3}$ E. None of the above.

36. The area of a rectangular patio is given by the equation $y = -x^2 + 10x + 200$, where x is measured in feet. Find the maximum area of the patio.
A. 245 ft^2 B. 5 ft^2 C. 275 ft^2 D. 225 ft^2 E. None of the above.

37. When a certain make of car is purchased for \$18,000, its trade-in value t years after purchase is given by $V(t) = 18,000(.85)^t$ dollars. Find the car's trade in value after 4 years, rounded to the nearest dollar.
A. \$8,604 B. \$5,480 C. \$9,396 D. \$6,120 E. None of the above.

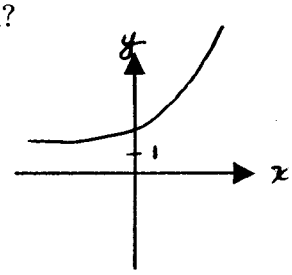
38. At what simple interest rate will \$2000 accumulate to \$3480 in 8 years?
A. 9.25 percent B. 5.75 percent C. 18.5 percent D. 8.5 percent E. None of the above.

39. What amount invested today will accumulate to \$34,000 by the end of 8 years if it is invested at 8.5% compounded monthly? (Give your answer rounded to the nearest cent.)
A. \$17,702.76 B. \$20,238.09 C. \$66,951.16 D. \$15,186.83 E. \$17,266.32

40. Maria Valdez is going to make quarterly deposits of \$425 in a savings account. How much will she have after 12 years if the account pays 6% annual interest, compounded quarterly? (Give your answer rounded to the nearest dollar.)
A. \$20,400 B. \$25,296 C. \$41,687 D. \$29,565 E. \$32,659

41. Find the periodic payment required to repay a \$20,000 loan over 5 years, with monthly payments at a 6% annual rate.
A. \$1237.51 B. \$487.22 C. \$1267.88 D. \$386.66 E. None of the above.

42. The graph to the right can best be described by which equation?
A. $y = 2^x + 1$ B. $y = \log_2 x + 1$ C. $y = x^2 + 1$
D. $y = 2^{-x} + 1$ E. $y = \log_2(x + 1)$



SOLUTIONS

1. B; 2. E $(-\frac{5}{2})$; 3. B; 4. D; 5. A; 6. E $(x = 19)$; 7. A; 8. E; 9. A; 10. D; 11. B; 12. C; 13. A; 14. B; 15. D; 16. D; 17. E $(-\frac{1}{2}, 2)$; 18. C; 19. C; 20. C; 21. C; 22. E; 23. C; 24. E (-26); 25. A; 26. B; 27. B; 28. A; 29. D; 30. E; 31. B; 32. C; 33. A; 34. D; 35. A; 36. D; 37. C; 38. A; 39. E; 40. D; 41. D; 42. A.