

FINAL REVIEW – MAC1105 (College Algebra)

1. Solve: $x^2 - 2x + 4 = 0$
a.) $\{1 \pm i\sqrt{3}\}$ b.) $\{-2, 4\}$ c.) $\{1 \pm \sqrt{5}\}$ d.) $\{2\}$ e.) $\{1 \pm i\sqrt{5}\}$
2. Solve: $8x^4 - 18x^3 - 5x^2 = 0$
a.) $\left\{-\frac{1}{4}, \frac{5}{2}\right\}$ b.) $\left\{\frac{1}{4}, \frac{5}{2}\right\}$ c.) $\left\{0, -\frac{5}{2}, \frac{1}{4}\right\}$ d.) $\left\{0, \frac{5}{2}, -\frac{1}{4}\right\}$ e.) $\{0\}$
3. Solve: $\sqrt{2x} + 4 = x$
a.) $\{-4\}$ b.) $\{-1\}$ c.) $\{8\}$ d.) $\{-8, -2\}$ e.) $\{8, 2\}$
4. Solve the following inequality. Express the solution in interval notation. $x^2 + 5x - 6 > 0$
a.) $(-6, 1)$ b.) $[-6, 1]$ c.) $(-\infty, -6) \cup (1, \infty)$ d.) $(-\infty, -6] \cup (1, \infty)$ e.) $(-\infty, -6] \cup [1, \infty)$
5. Solve the following inequality. Express the solution set using interval notation. $|x - 2| < 3$
a.) $(-3, 3)$ b.) $(-1, 5)$ c.) $(-\infty, -3) \cup (3, \infty)$ d.) $(-\infty, 3)$ e.) $(-\infty, -1) \cup (5, \infty)$
6. Solve the following inequality. Express the solution set using interval solution. $\frac{3x + 2}{x - 5} \leq 0$
a.) $\left[-\frac{2}{3}, 5\right)$ b.) $\left(-\frac{3}{2}, 5\right)$ c.) $\left[\frac{3}{2}, 5\right]$ d.) $\left(-\frac{2}{3}, 5\right)$ e.) $\left[-\frac{2}{3}, 5\right]$
7. If $f(x) = 3x^2 - 2$, find $f(-3)$
a.) 25 b.) 21 c.) 3 d.) -11 e.) -29
8. Find the domain of $f(x) = \sqrt{3x - 2}$
a.) $(0, \infty)$ b.) $\left(-\frac{2}{3}, \infty\right)$ c.) $[0, \infty)$ d.) $\left[\frac{2}{3}, \infty\right)$ e.) $(-\infty, 0)$
9. Determine the vertex of the quadratic function $y = (x - 3)^2 + 4$
a.) $(3, 4)$ b.) $(3, -4)$ c.) $(4, 3)$ d.) $(4, -3)$ e.) $(-3, 4)$

10. Name the center and radius of the circle $x^2 + y^2 - 4x + 6y - 3 = 0$

a.) (2, -3) $r = 4$ b.) (-2, 3) $r = 4$ c.) (-2, 3) $r = 2$

d.) (2, -3) $r = \sqrt{3}$ e.) (-2, -3) $r = \sqrt{3}$

11. Find the length of the line segment from (-3, 2) to (5, -1)

a.) $\sqrt{5}$ b.) 10 c.) $\sqrt{73}$ d.) 1 e.) 8

12. Identify the type of symmetry that the equation $x^2 - 6x + y^2 = 0$

a.) x - axis b.) y - axis c.) Origin d.) x - axis, y - axis and origin e.) None

13. Find the vertex of the parabola $f(x) = -4x^2 + 40x - 93$

a.) (5, 7) b.) (4, 10) c.) (-3, 4) d.) (-3, -6) e.) (-5, 7)

14. Find two numbers whose sum is 40, such that the sum of the square of one number plus 6 times the other number is a minimum.

a.) 2 and 38 b.) 3 and 37 c.) 4 and 36 d.) 5 and 35 e.) 6 and 34

15. If $f(x) = x^2 - x - 1$ and $g(x) = -x + 3$ find $(f \circ g)(x)$

a.) $x^2 + 6x + 11$ b.) $x^2 - 5x + 5$ c.) $x^2 + x + 4$

d.) $-x^2 - x - 4$ e.) $-x^2 - 6x + 5$

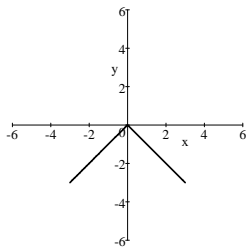
16. For the parabola $y = 2x^2 - x - 1$, the x-intercepts are

a.) (0, -1) b.) $(-\frac{1}{2}, 0)$ and (1, 0) c.) $(\frac{1}{2}, 0)$ and (-1, 0)

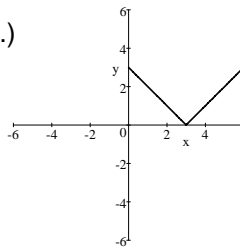
d.) (0, -1) and (1, 0) e.) None of these

17. The graph of $f(x) = |x - 3|$ is

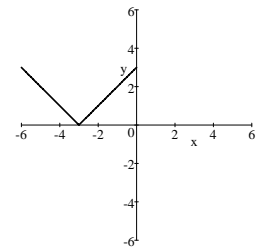
a.)



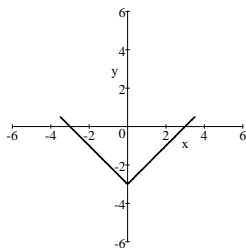
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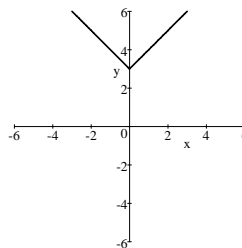
c.)



d.)

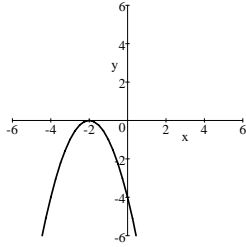


e.)

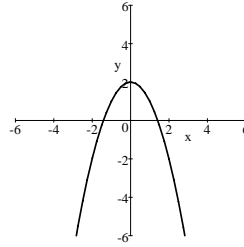


18. The graph of $f(x) = -x^2 + 2$ is

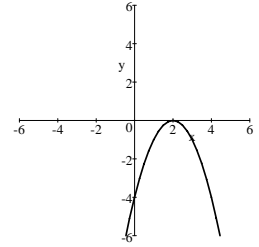
a.)



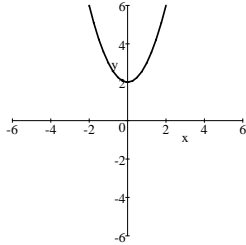
b.)



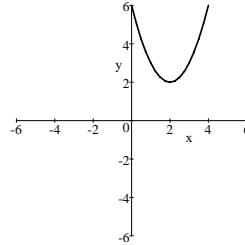
c.)



d.)



e.)



19. If $f(x) = -3x + 2$ find $f^{-1}(x)$

a.) $3x - 2$

b.) $\frac{x+2}{3}$

c.) $\frac{x-2}{3}$

d.) $-\frac{x-2}{3}$

e.) $-2x - 3$

20. If $f(x) = 3x - 4$ and $g(x) = 2x + 3$, find $(g - f)(x)$

a.) $-x + 7$

b.) $x - 7$

c.) $x - 1$

d.) $-x - 1$

e.) None of these

21. Solve for x : $3^{4x-1} = 81$

a.) $\left\{\frac{41}{2}\right\}$

b.) $\left\{\frac{3}{2}\right\}$

c.) $\left\{\frac{5}{4}\right\}$

d.) 2

e.) None of these

22. Write $7^3 = 343$ in its equivalent logarithmic form

a.) $\log_3 343 = 7$

b.) $\log_3 7 = 3$

c.) $\log_7 343 = 3$

d.) $\log_7 3 = 343$

e.) $\log_{343} 3 = 7$

23. Solve for x ; $\log(5x - 3) - \log(2x + 1) = \log 2$

a.) $\{5\}$

b.) $\left\{\frac{4}{3}\right\}$

c.) $\{2\}$

d.) $\{1\}$

e.) None of these

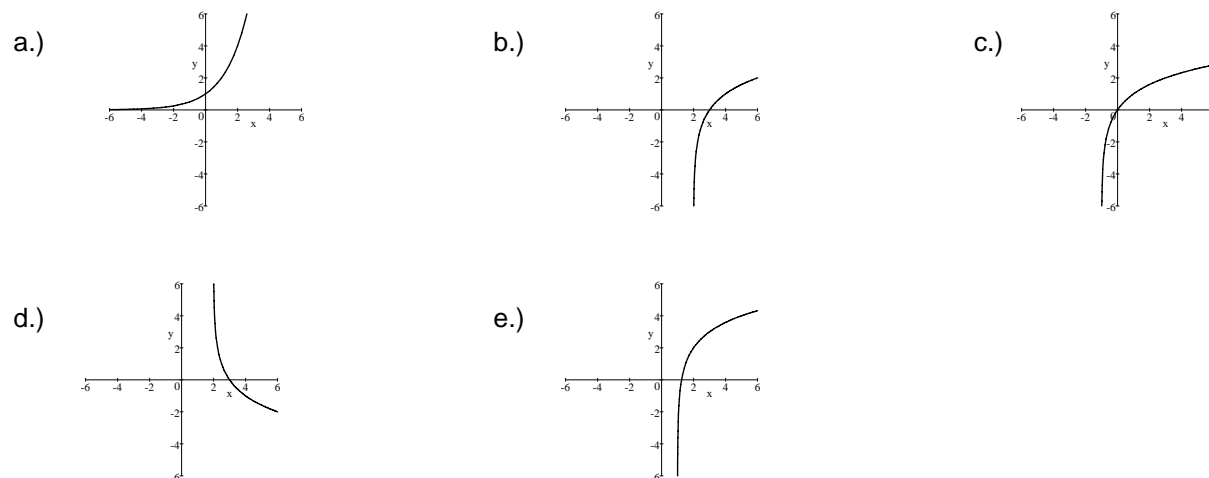
24. Use logarithmic properties to express the following as a single logarithm. $\frac{1}{2}(\log_b x - \log_b y^3)$

- a.) $\log_b \frac{x}{2y^3}$ b.) $\log_b \sqrt{x - y^3}$ c.) $\log_b \sqrt{\frac{x}{y^3}}$ d.) $\log_b xy^3$ e.) None of these

25. Solve for x: $\log_2(x + 2) + \log_2 x = 3$

- a.) $\{-4, 2\}$ b.) $\{2\}$ c.) $\{1\}$ d.) $\{-3, 1\}$ e.) $\{-3\}$

26. The graph of $\log_2(x - 2)$ is



27. The amount of a radioactive material, in grams, present after t days is given by $A(t) = 2000e^{-0.02t}$. To the nearest gram, find the amount present after 30 days.

- a.) 1097 b.) 2145 c.) 875 d.) 124 e.) 1012

28. If \$2000 is invested at 6% compounded quarterly for 3 years, how much will it be worth at the end of that time?

- a.) \$2543.65 b.) \$2391.24 c.) \$2988.45 d.) \$3000 e.) \$2655.88

29. Solve for x: $3^x = 10$

- a.) 1.98 b.) 2.10 c.) 4.12 d.) .67 e.) 3.45

30. Evaluate $\ln e^3$.

- a.) -3 b.) 1.307 c.) $3e$ d.) $1/3$ e.) 3

31. Find the value of x in the solution for the system $\begin{cases} 9x + 5y = -34 \\ 7x + 4y = -26 \end{cases}$

- a.) 3 b.) -6 c.) 6 d.) 10 e.) 4

32. A chemist needs 12 liters of a 40% alcohol solution. She must mix a 20% solution and a 50% solution. How many liters of 50% solution will be required to obtain what she needs?

- a.) 2 liters b.) 4 liters c.) 6 liters d.) 8 liters e.) 10 liters

33. Linda invested a certain amount of money at 8% yearly interest and \$200 more than that at 9% yearly interest. Her total interest for a year from the two investments was \$188. How much did she invest at 8%?

- a.) \$800 b.) \$1000 c.) \$1300 d.) \$1600 e.) \$2000

34. Find the value of x in the system: $\begin{cases} 2x + 3y - z = 17 \\ 4y - z = 15 \\ 2y + z = 9 \end{cases}$

- a.) 3 b.) 4 c.) 1 d.) -1 e.) -2

35. Suppose that the augmented matrix of a system of three linear equations in x , y and z can be changed

to the matrix $\begin{vmatrix} 1 & -2 & 2 & 5 \\ 0 & 1 & 3 & -2 \\ 0 & 0 & 2 & 4 \end{vmatrix}$

What is the value of y ?

- a.) -8 b.) 4 c.) 12 d.) -15 e.) -10

36. Find the midpoint of the line determined by the points $(-3,1)$ and $(5,-5)$

- a.) $(1, 2)$ b.) $(-1, -2)$ c.) $(-1, 2)$ d.) $(-8, 4)$ e.) $(1, -2)$

MAC1105 – FINAL REVIEW ANSWERS

1. A
2. D
3. C
4. C
5. B
6. A
7. A
8. D
9. A
10. A
11. C
12. A
13. A
14. B
15. B
16. B
17. B
18. B
19. D
20. A
21. C
22. C
23. A
24. C
25. B
26. B
27. A
28. B
29. B
30. E
31. B
32. D
33. B
34. A
35. A
36. E