

# Math 110 Proficiency Test

## Practice Exam Instructions

This is a practice exam for the Math 110 Proficiency Test. If your initial mathematics placement is MTH 110, this was due to an ACT score in mathematics that was not sufficiently high, or not enough high school mathematics credits. If you have had a great deal of mathematics in high school, such as an FST course (functions-statistics-trigonometry) and had a bad day on the ACT, you are strongly encouraged to take the MTH 110 proficiency test to see if you can test out of MTH 110.

Please pay attention to the following instructions:

- The practice exam is 60 minutes in length – please time yourself as you take the exam.
- You may use a calculator for the practice exam (graphing calculator preferred)
- A legitimate score of 34 or higher on this practice test suggests that you will be able to pass the MTH 110 Proficiency Test. Please visit the Testing Services webpage at [www.gvsu.edu/testserv](http://www.gvsu.edu/testserv) for testing dates and information, or you can contact the Advising Resource Center at (616) 331-3588.

June 2009

1.  $2,500,000 \times 400,000 =$  \_\_\_\_\_
  - a) 100,000,000,000
  - b) 1,000,000,000
  - c) 10,000,000
  - d) 1,000,000,000,000
  - e) none of these
2. The remainder when 894 is divided by 16 is \_\_\_\_\_
  - a) 8
  - b) 14
  - c) 12
  - d) .875
  - e) 55
3. If 2.85 is subtracted from 30.6, then the result is \_\_\_\_\_
  - a) 0.21
  - b) 33.45
  - c) 27.75
  - d) 5.91
  - e) -27.75
4.  $3\frac{1}{7} + 4\frac{7}{9}$   
a)  $7\frac{8}{16}$       b)  $7\frac{8}{63}$       c)  $7\frac{58}{63}$   
d)  $\frac{67}{16}$       e)  $7\frac{16}{63}$
5. How many dozens of eggs are there in 6 boxes, each containing 30 eggs?  
a) 15    b) 12    c) 180    d) 5    e) 72
6.  $\frac{3}{11} \div \frac{5}{6} =$   
a)  $\frac{18}{55}$     b)  $\frac{55}{18}$     c)  $\frac{15}{66}$     d)  $\frac{5}{22}$   
e) none of these

7. Jose can assemble 12 car parts in 40 minutes. How many minutes would be needed to assemble 9 parts?

- a) 2.7   b) 27   c)  $53\frac{1}{3}$    d) 60   e) 30

8. What percent of 48 is 60?

- a) 125%   b) 25%   c) 1.25%   d) 80%   e) 0.8%

9. Which of the following best approximates  $5.3 \times 40.2$ ?

- a) 22.26   b) 231.006   c) 2130.6   d) 213.05  
e) 200.6

10. If  $7 + 3x = -2(x + 4)$ , then  $x =$

- a) -5   b) -1   c) -15   d)  $\frac{-13}{5}$    e) -3

11. The base of a rectangular box measures 3 ft by 6 ft. What is the height (in feet) of the box if the volume is 72 cubic feet?

- a) 90   b) 1296   c) 4   d) 12   e) 24

12. If  $0.02x = 40$ , then  $x =$

- a) 0.8   b) 39.98   c) 2000   d) 80   e) 200

13.  $3[13 - 7(5 - 2)] =$  \_\_\_\_\_

- a) -60   b) 18   c) -72   d) -24   e) 54

14.  $x^5 y^2 \cdot x^5 y =$  \_\_\_\_\_

- a)  $2x^5 y^2$    b)  $x^{10} y^2$    c)  $x^5 y^3$    d)  $2x^{10} y^3$   
e)  $x^{10} y^3$

15. The graph of the equation  $3x - 2y + 24 = 0$  crosses the x-axis at  $x =$

- a) 12   b) 0   c) 8   d) -12   e) -8

16. If  $2x - \frac{3}{2} = 4x - \frac{11}{2}$ , then  $x =$  \_\_\_\_\_

- a) 2   b)  $\frac{1}{2}$    c)  $\frac{7}{2}$    d) -2  
e) no solution

17. Money in a bank triples every 10 years. If \$100 is deposited today, what will its value be after 40 years?

- a) \$400   b) \$1200   c) \$6400   d) \$8100   e) \$24,300

18.  $(3x^3)^2 =$  \_\_\_\_\_

- a)  $6x^6$    b)  $9x^5$    c)  $6x^5$    d)  $3x^6$    e)  $9x^6$

19.  $(5y^2 - 2 + 3y) + (y^2 - 4y + 7) =$  \_\_\_\_\_

- a)  $6y^2 - 6y + 10$   
b)  $6y^4 - y^2 + 5$   
c)  $6y^2 - y + 5$   
d)  $6y^2 - 7y + 9$   
e) none of these

20. If  $y = 3x^2 - 3x + 5$  and  $x = -2$ , then  $y =$  \_\_\_\_\_

- a) 11   b) 47   c) 23   d) -1   e) 35

21. The height of a triangle is 3 more than its base. If  $x$  is the base, then its area is \_\_\_\_\_

- a)  $\frac{1}{2}x^2 + 3x$    b)  $\frac{1}{2}x^2 + \frac{3}{2}$    c)  $\frac{1}{2}x^2 + \frac{3}{2}x$   
d)  $x^2 + 3x$    e)  $x^2 - 3x$

22. One factor of  $x^2 + 2x - 8$  is

- a)  $x + 2$    b)  $x - 8$    c)  $x - 2$    d)  $x - 4$   
e)  $x + 6$

23. In a standard coordinate system, the graph of the equation  $y = 2x - 5$  is

- a) A line falling to the right.
- b) A line rising to the right.
- c) A vertical line.
- d) A horizontal line.
- e) Not a line.

24. If  $x \geq 0$ , then  $\sqrt{25x^3} - \sqrt{9x^3} = \underline{\hspace{2cm}}$

- a)  $4x\sqrt{x}$
- b) 4
- c)  $2x^2\sqrt{x}$
- d)  $2x\sqrt{x}$
- e)  $4x^3$

25. In a gymnastics meet Kim had a score of 8.1 on vault, 7.5 on beam, and 7.8 on bars. What must be scored on floor to have an all around average of 7.7?

- a) 7.6
- b) 7.4
- c) 215.7
- d) 7.8
- e) 7.5

26.  $\frac{x+4}{4x} - \frac{4}{x} = \underline{\hspace{2cm}}$

- a)  $\frac{1}{4x}$
- b)  $\frac{x-12}{4x}$
- c)  $\frac{1}{4}$
- d) -3
- e)  $\frac{x-3}{x}$

27.  $(3a-5b)^2 = \underline{\hspace{2cm}}$

- a)  $9a^2 - 15ab + 25b^2$
- b)  $9a^2 - 30ab + 25b^2$
- c)  $3a^2 - 5b^2$
- d)  $9a^2 - 15ab - 25b^2$
- e)  $9a^2 + 25b^2$

28. If  $2x - 3 < 4x - 3$ , then  $\underline{\hspace{2cm}}$

- a)  $x < -3$
- b)  $x > 0$
- c)  $x > -1$
- d)  $x < 1$
- e)  $x < -1$

29. If  $m^2 = m + 6$ , then  $m = \underline{\hspace{2cm}}$

- a) 0 or -3
- b) 3 or -2
- c) -6 or 1
- d) -3 or 2
- e) -1 or 6

30. The perimeter of a rectangle is 240 feet. If the length is 12 feet, then the width is
- a) 20 feet.
  - b) 108 feet.
  - c) 114 feet.
  - d) 216 feet.
  - e) 228 feet.

31. If  $5b - 2a = 2 - b$ , then  $a = \underline{\hspace{2cm}}$

- a) 1-3b
- b) 3b-1
- c) 6b-1
- d) 3b-2
- e) 2-3b

32.  $16^{1/2} - 16^0 = \underline{\hspace{2cm}}$

- a) 8
- b) 0
- c) 7
- d) 3
- e) -8

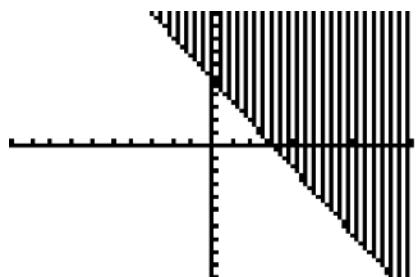
33. If the point (-2, 3) lies on the line whose equation is  $ax + 4y = 2$ , then  $a = \underline{\hspace{2cm}}$
- a) -7
  - b) -5
  - c)  $\frac{10}{3}$
  - d) -8
  - e) 5

34. The slope of the line  $5x + 7y - 4 = 0$  is
- a)  $\frac{7}{5}$
  - b)  $\frac{5}{7}$
  - c)  $-\frac{7}{5}$
  - d)  $-\frac{5}{7}$
  - e)  $\frac{4}{7}$

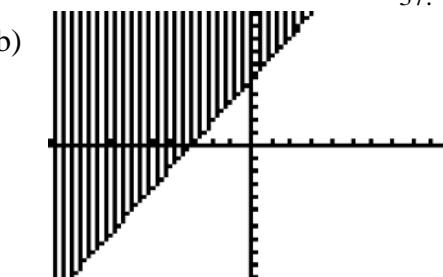
35.  $3[-2x - 3(x - x^2) + 4] - x = \underline{\hspace{2cm}}$
- a)  $9x^2 - 16x + 12$
  - b)  $9x^2 + 16x - 12$
  - c)  $-9x^2 - 16x + 12$
  - d)  $-9x^2 + 16x + 12$
  - e) none of these

36. The graph of  $5x - 3y \geq 15$  on a standard window is

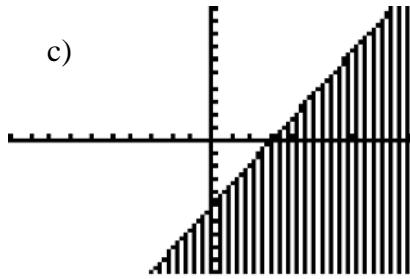
a)



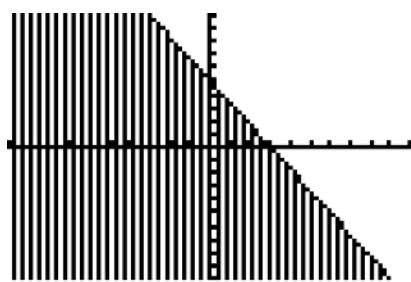
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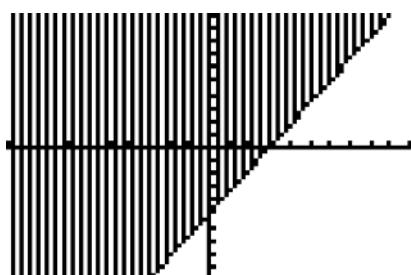
c)



d)



e)



37.  $\frac{12a^6b^4 + 4ab^6}{2ab^2} =$

- a) 8    b)  $6a^5b^2 + 4ab^6$     c)  $6a^6b^2 + 2b^4$   
d)  $6a^5b^2 + 2b^4$     e)  $6a^5b^2 + 2b^3$

$$\frac{x^2 - 9}{x^2 + 4} \div \frac{x+3}{x+2} = \underline{\hspace{2cm}}$$

- a)  $\frac{x-3}{x+2}$     b)  $\frac{-3}{2}$     c)  $\frac{(x-3)(x+2)}{x^2 + 4}$   
d)  $\frac{x+3}{x+2}$     e)  $\frac{-x-6}{4}$

To get to work from my home, I travel 8 miles north and then turn west and travel 6 miles. If I could travel in a straight line from my home to work, how much distance would I save?

- a) 2 miles    b) 4 miles.    c) 10 miles.    d) 14 miles.  
e) 86 miles.

The value of  $x$  in the solution to the system  $\begin{cases} x + 2y = 5 \\ 2x - y = 5 \end{cases}$  is \_\_\_\_\_

- a) 3    b) 2    c) -1    d) 1    e) 0

41.  $\sqrt[3]{27a^5y^{12}} =$

- a)  $3a^2y^9$     b)  $9a^2y^9$     c)  $3ay^4\sqrt[3]{a^2}$     d)  $3ay^4\sqrt{a^2}$   
e)  $9ay^4\sqrt[3]{a^2}$

42. One of the solutions to the equation  $x^2 + 20 = -4x$  is

- a) -20    b) -24    c)  $-2 + 4i$     d)  $2 + 4i$     e)  $4i$

43. If  $\log_2 16 = x$ , then  $x = \underline{\hspace{2cm}}$

- a) 8   b) 4   c) 14   d)  $\frac{1}{8}$    e)  $\frac{1}{4}$

44. If  $f(x) = -2^{x+4}$ , then  $f(-2) =$

- a)  $-\frac{15}{4}$    b)  $\frac{15}{4}$    c)  $\frac{17}{4}$    d) -4   e) 4

45. If  $\sqrt{2x+3} - x = 0$ , then  $x = \underline{\hspace{2cm}}$

- a) 0 or  $\frac{-3}{2}$    b)  $-1 \pm i\sqrt{2}$    c) 3   d) -1   e) 3 and -1

46.  $t^4 - 8t^2 + 16$  factors completely over the reals into

- a)  $(t+2)^2(t-2)^2$   
b)  $(t^2 - 4)^2$   
c)  $(t^2 + 4)(t^2 - 4)$   
d)  $(t^2 - 8)(t^2 - 2)$   
e)  $(t-2)^4$

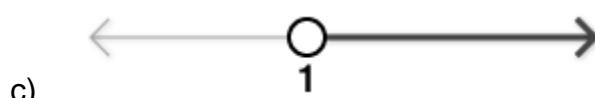
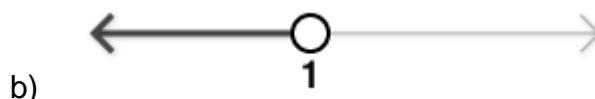
47. If  $\frac{x}{x+1} = \frac{x+6}{x+1} - \frac{8}{x}$  then  $x = \underline{\hspace{2cm}}$

- a) -4   b) -1   c) 4   d)  $\frac{-1}{4}$    e)  $\frac{7}{4}$

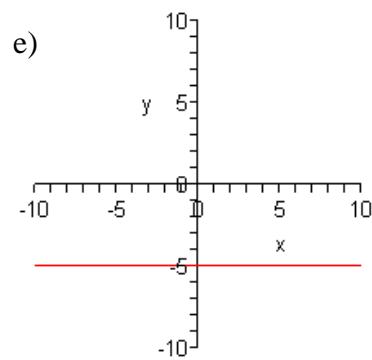
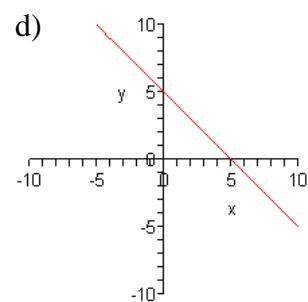
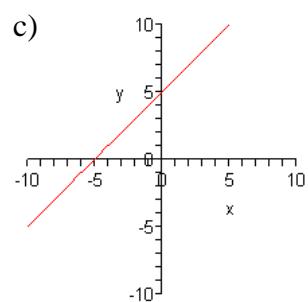
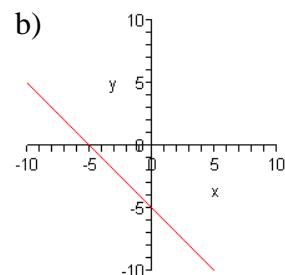
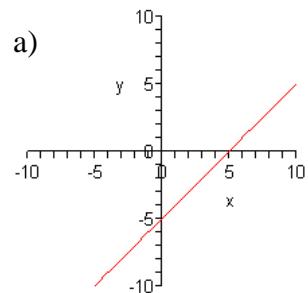
48. The graph of the parabola  $y = 3x^2 + 12x + 5$  is symmetric with respect to the line

- a)  $y = -7$    b)  $y = 7$    c)  $x = -2$    d)  $x = 2$   
e)  $x = 12$

49. Of the following graphs, which best represents the solution of the inequality  $2x + 3 < 5$ ?



50. Which of the following best represents the graph of  $x + y = 5$ ?



## Math 110 Sample Placement Test Answers

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