

COLLEGE-LEVEL MATHEMATICS TEST

A total of 20 questions are administered in the College-Level Mathematics Test (CLM). CLM assesses proficiency in intermediate algebra through Pre-calculus.

Questions administered in this test, re present six general categories as follows:

- Algebraic Operations including simplifying rational algebraic expressions, factoring and expanding polynomials, and manipulating roots and exponents.
- Solutions of Equations and Inequalities including the solution of linear and quadratic equations and inequalities, systems of equations, and other algebraic equations.
- Coordinate Geometry involving plane geometry, the coordinate plane, straight lines, conics, sets of points in the plane, and graphs of algebraic functions.
- Applications and other Algebra topics including complex numbers, series and sequences, determinants, permutations and combinations, factorials, and word problems.
- Functions including questions involving polynomial, algebraic, exponential and logarithmic functions.
- Trigonometry category including trigonometric functions.

Summary of Test Specification for Core Tests

ACCUPLACER TEST College Level Math (CLM)	Approximate Percentage of Test
Algebraic Operations	20 percent
Solutions of Equations and Inequalities	15 percent
Coordinate Geometry	15 percent
Functions	20 percent
Trigonometry	20 percent
Application and Other Algebra Topics	10 percent

Sample Question

Solve the following problem. You may use the paper you have been given for scratchwork.

If the 1st and 3rd terms of a geometric sequence are 3 and 27, respectively, then the 2nd term could be:

- 6
- 9
- 12
- 15
- 18

The correct answer is 9.

MONTGOMERY COLLEGE
Department of Mathematics

College Mathematics Practice Test

Review the following questions only if you have already successfully completed second year algebra or a higher level mathematics course.

1. $(x + y)^2 + (x - 3y)^2 =$
 - a) $2x^2 + 8xy + 10y^2$
 - b) $2x^2 + 10y^2$
 - c) $2x^2 + 7y^2$
 - d) $2x^2 - 8y^2$
 - e) $2x^2 - 4xy + 10y^2$

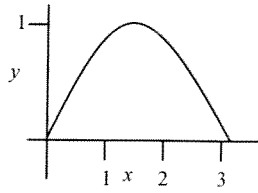
2. If $f(x) = \frac{x-5}{2}$ and $g(x) = x^2 - 2x$ then $g(f(-1)) =$
 - a) 1
 - b) 3
 - c) 15
 - d) 9
 - e) -3

3. A rectangle has a length of $N - 3$ and a width of $3N^2 + 4N$. What is its perimeter?
 - a) $3N^3 - 5N^2 - 12N$
 - b) $3N^3 + 4N^2 - 3$
 - c) $3N^2 + 5N - 3$
 - d) $3N^3 - 12N$
 - e) $6N^2 + 10N - 6$

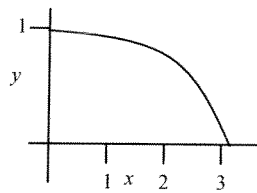
4. $\frac{8x}{3x-6} \cdot \frac{x^2-4}{2x+4} =$
 - a) $-\frac{4}{3}(x-1)$
 - b) $\frac{4x(x-2)}{3(x+2)}$
 - c) $\frac{4x^3-16x}{6x^2-12}$
 - d) $\frac{4}{3}x$
 - e) $\frac{x^2+8x-4}{5x-2}$

5. Which of the following could be the graph of $y = \cos^2 x$ for $0 \leq x \leq \pi$?

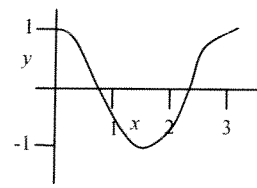
a)



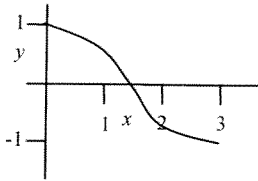
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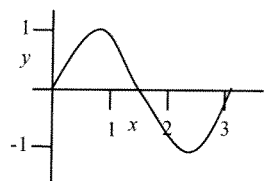
c)



d)



e)



6. $\sum_{n=1}^4 n(n-1) =$

a) 20

b) 12

c) 0

d) 144

e) 22

7. Which of the following equations could represent the graph at right?

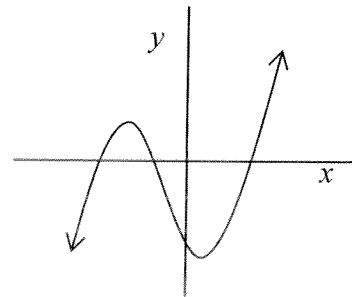
a) $y = 3x^3 - 18x - 12$

b) $y = x^2 - 4$

c) $y = x^3$

d) $y = -2x - 4$

e) $y = -x^3 + 3x^2 - 4$



8. Simplify $\frac{4}{4 + \sqrt{14}}$

a) $\frac{1}{1 + \sqrt{14}}$

b) $8 - 2\sqrt{14}$

c) $\frac{8 + 2\sqrt{14}}{15}$

d) $\frac{1 - \sqrt{14}}{-13}$

e) $\frac{2\sqrt{2}}{3}$

9. Which of the following is NOT equal to zero?

- a) $\cos\left(\frac{\pi}{2}\right)$ d) $\sin^{-1}(\pi)$
 b) $\tan(0^\circ)$ e) $\cos^{-1}(1)$
 c) $\cos\left(\frac{\pi}{4}\right) - \sin\left(\frac{\pi}{4}\right)$

10. The x -value(s) of all intersection points of $y = 6 - 2x$ and $y = x^2 + 3$ is (are)

- a) -1 only b) -3 only c) $1, -3$ d) $-1, 3$ e) $1, 3$

11. $\sin\theta(\csc\theta - \sin\theta) =$

- a) $\cos^2\theta$ d) $\cot\theta - \sin^2\theta$
 b) $\tan\theta - \sin^2\theta$ e) $\sin^2\theta$
 c) $\sec\theta - \sin^2\theta$

12. $\log x + \log 20 = 2$. Then $x =$

- a) $\frac{1}{10}$ b) 80 c) 5 d) -18 e) 1

13. $x^2 + 1$ is a factor of $f(x)$. Which of the following is TRUE?

- a) $f(-1) = 0$ d) $f(x)$ has an x -intercept of 1
 b) $f(x)$ has a y -intercept of -1 e) $f(0) = 1$
 c) $f(i) = 0$ where $i = \sqrt{-1}$

14. $2^{-5} \cdot 64^{\frac{2}{3}} =$

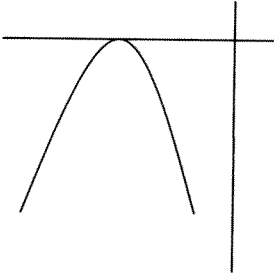
- a) 512 b) $\frac{1}{512}$ c) 16 d) 1 e) $\frac{1}{2}$

15. What is the least common denominator for $\frac{3x}{x^2 - 9}$ and $\frac{4}{2x + 6}$?

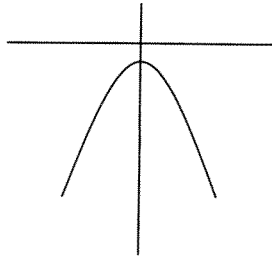
- a) $2(x^2 - 9)$ d) $2(x + 3)^2(x - 3)$
 b) $3x(2x + 6) + 4(x^2 - 9)$ e) $(x^2 - 9)(2x + 6)$
 c) $2(x - 3)$

16. Which of the following could be the graph of $y = -(x+a)^2$ where $a > 0$?

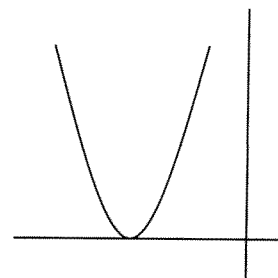
a)



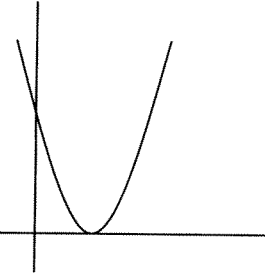
b)



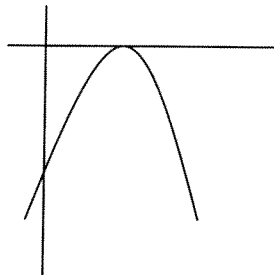
c)



d)



e)



17. Find the equation of the line passing through $(2, -4)$ and parallel to $3x + 2y = 4$.

a) $y = -\frac{3}{2}x + 1$

d) $y = -\frac{3}{2}x - 1$

b) $y = \frac{3}{2}x - 7$

e) $y = \frac{3}{2}x + 8$

c) $y = -\frac{2}{3}x - \frac{8}{3}$

18. Solve $\tan^2 x = 1$ where $0 \leq x \leq \pi$. Then $x =$

a) $\frac{\pi}{2}$

b) $\frac{\pi}{4}, \frac{3\pi}{4}$

c) $1, -1$

d) 0

e) $\frac{\pi}{4}$

19. Solve for y : $\frac{1}{y+1} + a = \frac{3}{y+1}$

a) $\frac{2}{a}$

b) $\frac{2-a}{a}$

c) $2a-1$

d) $2-a$

e) $a-3$

20. Solve $|2x-8| < 10$

a) $x < 9$

b) $-9 < x < 9$

c) $x < 1$

d) $x > 9$

e) $-1 < x < 9$

Answers to College Mathematics Practice Test

1. e
2. c
3. e
4. d
5. d
6. a
7. a
8. b
9. d
10. c
11. a
12. c
13. c
14. e
15. a
16. a
17. d
18. b
19. b
20. e