Math Placement Sample Exam
University of Nebraska – Lincoln

The Math Placement Exam (MPE) is required for all new students who have not received college credit for Calculus II with a C or better.

It is recommended that you take this sample test to get a feel for the types of questions and to determine if you need to review before taking the exam.

Directions:
Complete the four parts to the exam. You should not take more than 15 minutes for each part of the exam. If you are not fairly certain of how to do a problem, the problem should be left blank. After completing the exam, use the answer key to determine your score. Each part is graded with the following scoring scheme: 1 point per blank, 3 points per correct answer, and 0 points per wrong answer. There are 10 questions per part.

If your score was 19 or less in a part you might want to review using a Schaums Outline Series Study Guide which can be purchased on-line (Amazon or Follet websites) or at most large bookstores before taking the exam.

Part 1: Review for Part 1 Schaums Outline Elementary Algebra
Part 2: Review for Part 2 Schaums Outline Intermediate Algebra
Part 3: Review for Part 3 Schaums Outline Pre-calculus (skip trigonometry)
Part 4: Review for Part 4: Schaums Outline Pre-calculus

Questions:
New Transfer Students and Freshmen Students should contact New Student Enrollment at 402-472-4646 or nse@unl.edu.
Continue with Part 2

(4) \( \frac{34 + 8a}{42 + 2} \) (5) \( \frac{2x^2 + 2}{x^2} \)

10. \( \frac{3}{8} \) of these

9. \( \frac{2a - 2b - Z}{2a + 2b - Z} \)

8. If \( x - a = 4 + a \), then \( x \) is

7. \( \frac{2z}{x} - 2z \)

6. \( \frac{3}{x} \)

5. \( \frac{5}{x} \frac{y}{x} \frac{z}{x} \frac{y}{x} \)

4. \( \frac{b}{y} \frac{a}{y} \frac{c}{y} \)

3. \( \frac{4}{y} \frac{a}{y} \frac{b}{y} \frac{c}{y} \)

2. \( \frac{3}{y} \frac{2}{y} \frac{1}{y} \frac{0}{y} \)

1. \( \frac{1}{y} \frac{0}{y} \frac{2}{y} \frac{3}{y} \)

**Sheets**

Fill in your answers in the column labeled Part I on the answer sheet (Questions 1-30)

Start here if you have not studied trigonometry. Attempt Parts 1-30
Part 2

Questions 11 - 14)

Start here if you have studied trigonometry. Attempt Parts 2 - 4.
Continue with Part 4 if you have studied trigonometry, otherwise,

\[ f(x) = \log_2(x) \]

(A) \( \frac{y}{2} \)

(B) \( \frac{y}{4} \)

(C) \( \frac{y}{8} \)

(D) \( \frac{y}{16} \)

(E) \( \frac{y}{128} \)

\[ \frac{y}{2} = \frac{x}{8} \]

\[ \frac{y}{4} = \frac{x}{16} \]

24) The solution is the system of equations:

\[ \begin{cases} x - 3y = 8 \\ 2x + 6y = 5 \end{cases} \]

25) The slope of the line through the points \((-3, -3)\) and \((-1, -8)\) is

\[ m = \frac{-8 - (-3)}{-1 - (-3)} = \frac{-5}{2} \]

26) The inequality \((x + 3)(x - 2) < 0\) is equivalent to

\[ -2 < x < 2 \]

27) None of these

(A) \( y < 3 \)

(B) \( y > \frac{3}{2} \)

(C) \( y > \frac{3}{4} \)

(D) \( y > \frac{3}{8} \)

(E) \( y > \frac{3}{16} \)

28) If \( f(x) = 1 + x \) then \( f(1 + x) \) is none of these

(A) \( 6 \)

(B) \( 6 \)

(C) \( \frac{6}{1} \)

(D) \( \frac{6}{1} \)

(E) \( \frac{6}{1} \)

29) The slope of the line through the points \((-3, -3)\) and \((-1, -8)\) is

\[ m = \frac{-8 - (-3)}{-1 - (-3)} = \frac{-5}{2} \]

30) \[ 2 \log_2(x) + \log_2(x + 4) = \log_2(x + 8) \]

(A) \( \log_2(x) = 1 \)

(B) \( \log_2(x + 4) = 1 \)

(C) \( \log_2(x) = 0 \)

(D) \( \log_2(x + 4) = 0 \)

(E) \( \log_2(x) = \frac{4}{1} \)

31) The domain of the function \( f(x) = \sqrt{2x - 14} \) is

(A) \( x > 7 \)

(B) \( x < 7 \)

(C) \( x < 7 \)

(D) \( x > 7 \)

(E) \( x \leq 7 \)

32) None of these

(A) \( x < 2 \)

(B) \( x > 2 \)

(C) \( x < 2 \)

(D) \( x > 2 \)

(E) \( x \leq 2 \)

33) None of these

(A) \( x < 1 \)

(B) \( x > 1 \)

(C) \( x < 1 \)

(D) \( x > 1 \)

(E) \( x = 1 \)
Review your answers to questions 11 - 40 until time expires.

(A) \( \frac{\pi}{2} \) \( \frac{3\pi}{4} \) \( \frac{5\pi}{4} \) \( \pi \) (B) \( \frac{\pi}{3} \) \( \frac{\pi}{2} \) \( \frac{2\pi}{3} \) \( \pi \) (C) \( \frac{\pi}{4} \) \( \frac{\pi}{3} \) \( \frac{\pi}{2} \) \( \pi \) (D) \( \frac{\pi}{6} \) \( \frac{\pi}{4} \) \( \frac{\pi}{3} \) \( \frac{\pi}{2} \) (E) none of these

31) Which of the following numbers is largest?

(A) \( \tan \pi \) (B) \( \cot 0 \) (C) \( \sin 0 \) (D) \( \sin \pi \) (E) \( \tan \frac{\pi}{2} \)

32) For which values of \( \theta \) in the interval \( 0 \leq \theta \leq \pi \) is \( \cos \theta > 1 \)?

(A) \( \frac{\pi}{2} \) (B) \( \frac{3\pi}{4} \) (C) \( \frac{\pi}{3} \) (D) \( \frac{\pi}{4} \) (E) none of these

33) What is the radian measure of an angle whose degree measure is 75°?

(A) \( \frac{\pi}{3} \) (B) \( \frac{\pi}{4} \) (C) \( \frac{\pi}{2} \) (D) \( \frac{3\pi}{4} \) (E) \( \frac{5\pi}{6} \)

34) Which statement is true?

(A) \( \sin \theta = \cos \theta \) (B) \( \csc \theta = \sec \theta \) (C) \( \tan \theta = \cot \theta \) (D) \( \sec \theta = \csc \theta \) (E) none of these

35) The height which best represents the graph of \( y = \sin x \) is

(A) \( \frac{\pi}{2} \) \( \frac{3\pi}{4} \) \( \frac{5\pi}{4} \) \( \pi \) (B) \( \frac{\pi}{3} \) \( \frac{\pi}{2} \) \( \frac{2\pi}{3} \) \( \pi \) (C) \( \frac{\pi}{4} \) \( \frac{\pi}{3} \) \( \frac{\pi}{2} \) \( \pi \) (D) \( \frac{\pi}{6} \) \( \frac{\pi}{4} \) \( \frac{\pi}{3} \) \( \frac{\pi}{2} \) (E) none of these

36) For which of the following values of \( x \) is \( \sin x > \cos x \) not defined?

(A) \( \frac{\pi}{2} \) \( \frac{3\pi}{4} \) \( \frac{5\pi}{4} \) \( \pi \) (B) \( \frac{\pi}{3} \) \( \frac{\pi}{2} \) \( \frac{2\pi}{3} \) \( \pi \) (C) \( \frac{\pi}{4} \) \( \frac{\pi}{3} \) \( \frac{\pi}{2} \) \( \pi \) (D) \( \frac{\pi}{6} \) \( \frac{\pi}{4} \) \( \frac{\pi}{3} \) \( \frac{\pi}{2} \) (E) none of these

37) In the right triangle shown, which of the following labels is the answer "x"?

(A) \( \frac{\pi}{2} \) \( \frac{3\pi}{4} \) \( \frac{5\pi}{4} \) \( \pi \) (B) \( \frac{\pi}{3} \) \( \frac{\pi}{2} \) \( \frac{2\pi}{3} \) \( \pi \) (C) \( \frac{\pi}{4} \) \( \frac{\pi}{3} \) \( \frac{\pi}{2} \) \( \pi \) (D) \( \frac{\pi}{6} \) \( \frac{\pi}{4} \) \( \frac{\pi}{3} \) \( \frac{\pi}{2} \) (E) none of these

38) \( \frac{\tan \theta}{\cos \theta} = \sec \theta \) (B) \( \frac{\cos \theta}{\sin \theta} = \sec \theta \) (C) \( \frac{\sin \theta}{\cos \theta} = \csc \theta \) (D) \( \frac{\cos \theta}{\sin \theta} = \cot \theta \) (E) none of these

39) The period of the function \( y = \cos 2x \) is

(A) \( \frac{\pi}{2} \) (B) \( \frac{\pi}{4} \) (C) \( \frac{\pi}{3} \) (D) \( \frac{\pi}{6} \) (E) none of these

40) In the trigonometry column, the label part 4 on the answer.

Unless otherwise stated, angles are in radians.