

UNH Mathematics Placement Test

The UNH Mathematics Placement Test is designed to help us find the correct level of mathematics for you to begin with. You cannot fail it – you can only find the right place to start your mathematics program. Thus, it is worth your time reviewing your mathematics before you arrive for the testing program.

The test is administered online, and all questions are multiple choice. Each question you are given depends on your response to the previous questions. Calculators are permitted, but are generally not very helpful. You will be given one or two tests. Whether or not you are given the second test depends on the results of your first test. The first test (Algebra) contains 12 questions, and the second test (College Level Mathematics) contains 20 questions. There is no time limit on either test.

To help you prepare for the Placement Test, we are attaching sample questions, with answers, from each test. We strongly advise you to work through these problems in advance to help us more accurately assess your mathematics level upon entering college.

Algebra Test

1. Plot the point (14, -2) in the x-y plane.
2. Expand the expression $(x - 9)^2$.
3. If $3 = \frac{8-r}{r}$, then $r = ?$
4. Evaluate the expression: $3 - 4 + 5 - 6$.
5. $(2xy^3)^3 = ?$
6. Simplify: $\frac{1}{\left(\frac{1}{a} + \frac{1}{b}\right)}$.
7. Factor the expression $(x^2 + x - 12)$.
8. Simplify the expression $\frac{a}{a + a^2}$.
9. Solve the system of equations:
$$\begin{aligned}x + 2y &= 18 \\x - y &= 3\end{aligned}$$

College Level Mathematics Test

1. If the n -th term of a sequence is $n^2\left(-\frac{1}{2}\right)^n$, then the 5th term is?
2. If $f(x) = x^3 - 2x^2 + x - 1$, then $f(-x) = ?$
3. If $-\frac{\pi}{4} < \theta < \frac{\pi}{3}$, then the range of $\tan \theta$ is what interval?
4. If $xyz \neq 0$, and if $(-3xyz^3)^2 p = 18xy^2z^8$, solve for p .
5. Find the slope of the line in the plane passing through the points (1,1) and (2,0).
6. If $x < -3$, write the expression $|x| + 3$ without an absolute value symbol.
7. Simplify the expression: $\sin^4 \theta + 2 \sin^2 \theta \cos^2 \theta - 1 + \cos^4 \theta$.
8. Solve the following for x : $x^2 + 6 = 0$.
9. Simplify: $2^{5/2} - 2^{3/2}$.
10. Factor: $a(x - y) + (x - y)$.
11. If $f(x) = 5x - 3$ and if $f^{-1}(x)$ denotes the inverse function, find $f^{-1}(2)$.
12. Sketch the graph of $\sin^{-1}(x)$.
13. If $a \neq b$, solve for x in terms of a and b : $\frac{1}{x} + \frac{1}{a} = \frac{1}{b}$.
14. If the line $y = x - 6$ contains exactly one point in common with the circle $x^2 + y^2 = r^2$, then what is the value of r^2 ?
15. For what values of x is the graph of the function $f(x) = x(x + 4)$ below the x -axis?
16. If $f(x) = 3 - x$ and $g(x) = |x - 3|$, what is $f(g(x))$?
17. A window has the shape of a rectangle topped with a semicircle on one side of the rectangle. The side of the rectangle opposite the semicircle is $2x$, and the sides of the rectangle adjacent to the semicircle are each y . If the perimeter of the window is 16, write y in terms of x .
18. For how many angles θ is $\sin \theta = \frac{\sqrt{5}}{2}$?
19. The solution set to which of these equations is a function?
 - a) $x^2 + y^2 = 1$
 - b) $x^2 y^2 = 1$
 - c) $x^3 + y^3 = 1$
20. If $-2 < x < -1$, simplify the expression $|x^2 - 4| + |x^2 - 1|$ without absolute value signs.
21. Sketch the graph of the expression: $y = 3x^2 + 2x - 4$.