

Math/Stats

Math 115 Self-Assessment Test is designed to assist you to determine how ready *you* are to take Math 115 (Pre-Calculus) at UNBC.

Contents

1. About Math 115
2. How to take the Self Assessment Test
3. The Test
4. Scoring the Test, and What to do Next

1. About Math 115 (Pre-Calculus) at UNBC

As the name "Pre-Calculus" suggests, this course is designed for students who need a transitional course before they take a first-year university course in Calculus such as Math 152 or the sequence Math 100/101. The normal route to first-year Calculus is BC Principles of Mathematics 12 or equivalent. Math 115 allows students with only Math 11, or students with only a marginal standing in Math 12, a chance to prepare for first-year Calculus.

Math 115 begins with a brief review of Math 11 then moves on to deal with the more advanced topics of pre-calculus. There is usually additional time scheduled for a tutorial or lab for students. It is advised that you attend these sessions regularly!

Math 115 covers the following topics:

- simplifying algebraic expressions, factoring, rational expressions, exponents and radicals
- solving equations and inequalities, linear equations, rational equations, quadratic equations, radical equations, word problems
- analytic geometry; graphing, deriving, and using equations of lines, circles, parabolas
- functions, composite functions, inverse functions, transformations; sketching polynomial and rational functions
- an introduction to logarithmic and trigonometric functions

2. About the Self-Assessment Test

In order to be able to advise students as to their chances of reasonable success in the course, a diagnostic test may be administered at the start of Math 115. However, some students find that too late to rearrange their

courses if they choose to withdraw and others benefit from an opportunity to review prior to taking the in-class test.

The purpose of this Self-Assessment Test on the web is to allow you an early assessment, at a time when it is easier to make changes or to provide you with some focused topics for review.

The test should be taken without the aid of books or notes and should not be previewed. You may wish to have a look at a Math 11 text or the first chapter of the Math 115 text prior to writing the test, but write the test without the use of books or notes.

Do not use a calculator when you write the test. Calculators are not allowed on any of the quizzes, tests, or on the final exam for Math 115. The reason for this is simple: learning how to do arithmetic (like adding fractions) without a calculator leads to learning how to do algebra (like adding rational expressions).

You should have paper at hand in order to work out the questions on this test. After you have finished the whole test, look up the answers to score yourself. In assessing your score, you may refer to the guide in Section 4, below.

3. The Test

Instructions:

- Do not use a calculator.
- First answer all questions, and then check your answers.

Question #1. Complete the following calculations:

(a) $7 - (-3)$

(b) (i) $(-1)^2$ (ii) $(-1)^3$

(c) 3^{-2}

(d) $\frac{2}{3} + \frac{3}{5}$

Question #2. Simplify:

$$2x^5(3x^4)^3$$

Question #3. Subtract and simplify:

$$(4x^3 + 5x - 2) - (x^3 + 3x^2 - 2x + 1)$$

Question #4. Multiply and simplify:

$$(2x - 4)(x + 3)$$

Question #5. Factor:

$$x^2 + 2x - 8$$

$$\{e.g.: x^2 - 3x + 2 = (x - 2)(x - 1)\}$$

Question #6. Simplify:

$$\frac{x^2 + 2x + 1}{x^2 - 1}$$

Question #7. Subtract and simplify:

$$\frac{u + v}{u - v} - \frac{u - v}{u + v}$$

Question #8. Solve for x:

$$2(3x + 4) = 5 - (4x + 3)$$

Question #9. Solve for a:

$$a^2 = 3a - 2$$

Question #10.

Given that $f(x) = x^3 - 4x^2 + 2$,

find $f(2a)$.

Scoring Yourself, and What Your Score Means

Here are the answers. Each question is worth 1 point. Except for Question #1, there are no part marks for wrong answers.

1. (a) 10 (1/4 point)
(b)(i) 1 (ii) -1 (1/4 point if both are correct)
(c) 1/9 (1/4 point)
(d) 19/15 (1/4 point)
2. $54x^{17}$
3. $3x^3 - 3x^2 + 7x - 3$
4. $2x^2 + 2x - 12$
5. $(x + 4)(x - 2)$
6. $\frac{x+1}{x-1}$
7. $\frac{4uv}{(u+v)(u-v)}$
8. $x = -3/5$
9. "a = 2 or a = 1"
10. $8a^3 - 16a^2 + 2$

=====
10 points = 100%

So, how did you do? The following are some guidelines that may assist you in your decision to take Math 115 (Pre-Calculus).

If you scored 75% or better on this test then you should have enough background to start Math 115. However, how well you do in Math 115 will depend on how much new material you learn during the course.

If you scored between 25% and 74%, then your present knowledge of algebra may be insufficient or marginal and you will have to concentrate your efforts on this course if you take it. You will need to attend all the lectures and do all the practice homework. Attend the weekly tutorials/labs which are intended to support students and seek additional assistance from a math tutor at the Academic Success Centre. Plan on spending a good deal of time on this course. You may have to reduce your course load if you are to be successful in Math 115.

If you scored less than 25% on this test, then you should delay starting Math 115 until such time as you are better prepared for it. Students who are in this category, and who try Math 115 anyway, find that there is too much to learn in too short a time, and almost invariably they do not pass the course.

If you are a student at UNBC, then there are on-campus programs to help you prepare for starting Math 115 in a subsequent semester. Enquire about the XMAT bridging courses available through UNBC Continuing Studies. Be sure also to avail yourself of the one-to-one tutorials, which are the mainstay of ASC activities. ASC services are offered at no extra charge to all UNBC students.

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