

So...you are planning on taking Math 111 – College Algebra – next term...

Based on surveys of previous Math 111 students, the Mathematics Division and your fellow students want you to know that you should understand and have mastered all of the following topics and sample review questions in order to succeed in Math 111. However, this is only a sample of the important topics that are expected prerequisite knowledge for Math 111. The ability to complete this small sample of problems does not indicate complete readiness for the class. Rather, these questions should be used as a guideline for the basic types of problems to review before the first day of classes.

If you need more review, study the material and work problems from the chapters listed after each problem. All sections mentioned are in our current Math 089-095 book *Elementary & Intermediate Algebra* (3rd edition) by Tussy/Gustafson (T/G).

Topics from Algebra to review:

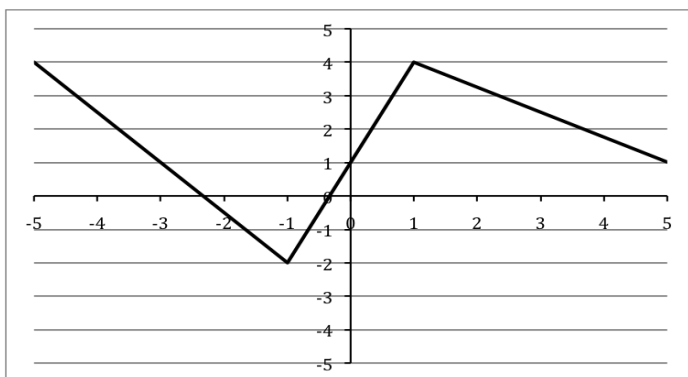
- Operations with fractions without the use of a calculator. (#1 and 2 below)
- Functions and function notation, reading information from a graph. (#3, 5 below)
- Domains of functions. (#4 below)
- Simplifying radical expressions. (#6 below)
- Factoring. (#7 below)
- Operations with polynomials (#8 below)
- Solving linear and quadratic equations. (#9 and #10 below)
- Solving exponential and logarithmic equations. (#11 below)
- Solving rational equations. (#12 below)
- Complex numbers. (#13 below)
- Solving linear inequalities. (#14 below)

Sample review questions:

Do the following problems **without** using a calculator. Answers that are not integers should be given in fraction, not decimal, form.

1. Add *mentally* (without scratch work).
a) $3x - \frac{-2x}{5} + 2x$ (T/G Section 2.3) b) $\frac{2}{x} + \frac{3}{x^2}$ (T/G Section 6.4)
2. Simplify the rational expression. (T/G Section 6.5)
$$\frac{\frac{2}{c^2}}{\frac{1}{c} + \frac{5}{4}}$$
3. Given $f(x) = 2x^2 - 3x + 1$, evaluate the following. Simplify your answers. (T/G Section 8.7, 8.8)
a) $f(-2)$
b) $f(x + 3)$
4. Find the domain of the following functions:
a) $f(x) = e^x$ (T/G Sections 11.3, 11.4)
b) $h(x) = \sqrt{3x - 2}$ (T/G Section 9.1)
c) $g(x) = \frac{x - 2}{x^2 - 4x - 12}$ (T/G Sections 6.1, 11.1)

5. Given the graph of $f(x)$,
- Find $f(1)$
 - Find all values of x such that $f(x) = 1$. (T/G Sections 8.7, 8.8)



6. Simplify the following radical expressions.
- $5\sqrt{2} + \sqrt{2}$ (T/G Section 9.3)
 - $3\sqrt{2} \cdot 4\sqrt{3}$ (T/G Section 9.4)
 - $\sqrt{48}$ (T/G Section 9.3)
 - $\frac{6 + \sqrt{18}}{3}$ (T/G Section 10.2)
7. Factor the following expressions completely.
- $3x^2 - 5x - 12$ (T/G Section 5.3)
 - $4x^2 - 9$ (T/G Section 5.4)
8. Multiply/expand the following expressions as indicated.
- $(3x^2 + 2x - 3)(2x + 1)$ (T/G Section 4.6)
 - $(2x - 1)^2$ (T/G Sections 4.6, 4.7)
9. Solve the following linear equations.
- $3(2x - 1) = 2x + 3$ (T/G Sections 2.1, 2.4)
 - $\frac{1}{4}x - 3 = \frac{2}{3}(x - 6)$ (T/G Sections 2.1, 2.4)
10. Solve the following quadratic equations.
- $x^2 - 5x - 36 = 0$ (T/G Sections 5.7, 10.1, 10.2)
 - $x^2 - 3x = 0$ (T/G Sections 5.7, 10.1, 10.2)
 - $x^2 + 4 = 0$ (T/G Sections 10.1, 10.2)
11. Solve the following equations.
- $\log_2(x - 1) = 3$ (T/G Section 11.5)
 - $e^{2x} = 5$ (T/G Section 11.8)
12. Solve for the variable y in the following equations. (T/G Section 6.6)
- $\frac{4}{y} - \frac{3}{y+1} = 1$
 - $\frac{1}{x} - \frac{1}{y} = 1$

13. Perform the following operations. Write your answer in standard form for a complex number $a + bi$.
- a) $(3 + 2i) - (6 - 4i)$ (T/G Section 9.7)
- b) $\frac{3 + 2i}{4 - 3i}$ (T/G Section 9.7)
14. Solve the following inequalities.
- a) $2 - 3(x - 2) < 5 - 6x$ (T/G Section 2.7)
- b) $3 < 5 - 2x \leq 8$ (T/G Section 8.1)

Sample review answers

<p>1. a) $\frac{27}{5}x$ b) $\frac{2x + 3}{x^2}$</p> <p>2. $\frac{8}{5c^2 + 4c}$</p> <p>3. a) 15 b) $2x^2 + 9x + 10$</p> <p>4. a) Dom. of f is all real numbers b) Dom. of h is $x \geq 2/3$ c) Dom. of g is all real numbers except 6 and -2.</p> <p>5. a) $f(1) = 4$ b) -3, 0 and 5</p> <p>6. a) $6\sqrt{2}$ b) $12\sqrt{6}$ c) $4\sqrt{3}$ d) $2 + \sqrt{2}$</p> <p>7. a) $(3x + 4)(x - 3)$ b) $(2x + 3)(2x - 3)$</p> <p>8. a) $6x^3 + 7x^2 - 4x - 3$ b) $4x^2 - 4x + 1$</p> <p>9. a) $x = \frac{3}{2}$ b) $x = \frac{12}{5}$</p> <p>10. a) $x = 9, x = -4$ b) $x = 0, x = 3$ c) $x = \pm 2i$</p>	<p>11. a) $x = 9$, b) $x = \frac{\ln(5)}{2}$</p> <p>12. a) $y = 2, y = -2$ b) $y = \frac{x}{1 - x}$</p> <p>13. a) $-3 + 6i$ b) $\frac{6}{25} + \frac{17}{25}i$</p> <p>14. a) $x < -1$ b) $-1.5 \leq x < 1$</p>
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Resources available:

- **Math Help Session** – Math Help Session starts in the first week of classes each term in BHL-107. Schedules are posted throughout Bauer Hall. During posted hours free tutoring is available from instructors who have volunteered their time. Video tapes and TV/VCR combos are also available in this room, as well as computers with some tutoring programs. See <http://web.clark.edu/math/helpsess.htm> for the current schedule.

- **Tutoring/Writing Center** – Tutoring services are available free of charge to all registered Clark College students. Faculty-recommended tutors provide help in many subject areas, not just math. You are encouraged to visit the Tutoring/Writing Center, in HKH-102, early in the quarter to request help and check posted tutor schedules. There is also a T/WC Annex in AA4-106.
See http://www.clark.edu/student_services/tutoring_center.php for more information.

- **Websites**
 - <http://web.clark.edu/math/Calculator/> - This website has videos demonstrating how to use a variety of features of the TI-84 graphing calculator. These videos will also be helpful to those who have a TI-83 calculator.
 - <http://www.purplemath.com/modules/index.htm>
 - <http://www.sosmath.com/algebra/algebra.html>
 - <http://www.interactmath.com/> – This website accompanies some of our textbooks and contains guided tutorials for not only those classes, but also for any algebra textbook by the same publisher. (e.g. Blitzer: Essentials of Introductory & Intermediate Algebra will contain useful examples and practice problems.)
***Note:** the download and installation of a plug-in is required.*
 - http://www.wtamu.edu/academic/anns/mps/math/mathlab/beg_algebra/beg_alg_tut_33_geom.htm - a tutorial covering some basic geometry skills you should know.

- **Books for possible review**
 - Forgotten Algebra (Paperback) by Bleau,
ISBN-13: 978-0764120084 (Available in the Clark library and bookstore.)
 - Algebra I (Cliffs Quick Review) (Paperback) by Bobrow,
ISBN-13: 978-0764563706 (Available in the Clark library and bookstore.)
 - Algebra II (Cliffs Quick Review) (Paperback) by Kohn and Herzog,
ISBN-13: 978-0764563713
 - Schaum's Outline of Elementary Algebra (Paperback),
ISBN-13: 978-0071410830
 - Schaum's Outline of Intermediate Algebra (Paperback),
ISBN-13: 978-0070608399