

## **So...you are planning on taking Math& 151 – Calculus I next term...**

Based on surveys and pretests of Math& 151 students, the Mathematics Division and your fellow students have some suggestions to help you succeed in Math& 151.

Because there is little or no time for review in Math& 151, you should understand and be comfortable with all of the following topics and sample review questions. However, these are only samples of some of the important topics that are expected prerequisite knowledge for Math& 151. 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.

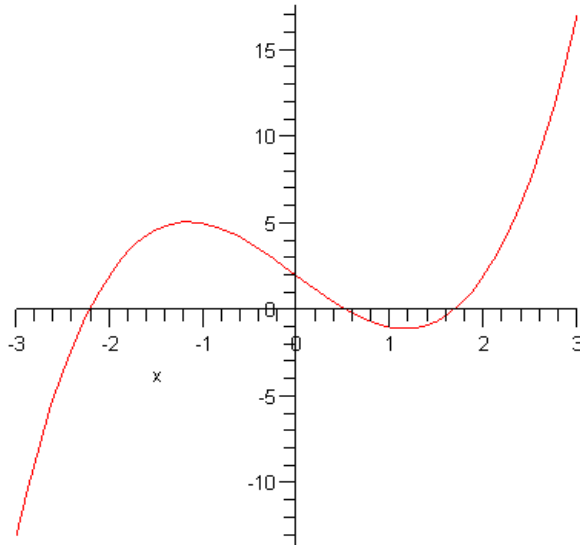
### **Topics from Algebra to review:**

- Operations with fractions without the use of a calculator.
- Interval notation and solving linear inequalities.
- Functions and function notation, domains of functions.
- Equations of lines.
- Factoring.
- Simplifying radical expressions.
- Logarithms and Exponential expressions.
- Solving linear, quadratic, cubic, radical, rational, exponential and logarithmic equations.
- Positive, negative and fractional exponents.

### **Sample review questions:**

1. Simplify  $[\frac{1}{6}(3)^3 - \frac{1}{2}(3)] - [\frac{1}{6}(2)^3 - \frac{1}{2}(2)]$ . Do not use a calculator.
  
2. Solve  $-8x + 2 \geq 10$ . Write your answer in interval notation.
  
3. Given  $f(x) = 2x^2 - 5x - 7$ , evaluate the following. Simplify your answers.
  - a)  $f(-2)$
  - b)  $f(x+4)$
  
4. Find the domain of the following functions:
  - a)  $g(x) = \sqrt{4x+9}$
  - b)  $h(x) = \frac{x+7}{x^2-5x-24}$
  - c)  $f(x) = \log(x-1)$

5. Given the graph of  $f(x)$ ,
- Find  $f(-1)$
  - Solve  $f(x) = 1$  for  $x$ .



6. Find the slope-intercept equation of the line that passes through  $(2, -4)$  with slope  $\frac{-5}{2}$ .

7. Rewrite  $(x + 5)^{\frac{1}{4}}$  as a radical expression.

8. Rewrite  $\sqrt{13x + 6}$  with a rational exponent.

9. Simplify  $\frac{8 - \sqrt{24}}{2}$ .

10. Write  $e^x = 25$  as logarithmic equation. Do not solve the equation.

11. Write  $\ln(27) = x + 2$  as an exponential equation. Do not solve the equation.

12. Simplify the following. Do not give decimal answers.

a.  $(-8)^{\frac{2}{3}}$

b.  $(9)^{-\frac{1}{2}}$

c.  $\frac{1}{2}(16)^{\frac{3}{2}}$

13. Rewrite  $2x^{-3}$  without a negative exponent.

14. Solve the following equations:

a.  $3x - 14 = 2(x + 5) - 10$

b.  $y^2 - 17y + 72 = 0$

c.  $2x^2 + 3x - 1 = 0$

d.  $x^3 - 9x = 0$

e.  $3x^3 - 15x^2 - 72x = 0$

f.  $\sqrt[3]{4x - 5} = 2$

15. Find the exact value of the following expressions.

a.  $\cos(\pi/3)$

d.  $\sin 300^\circ$

b.  $\tan(5\pi/4)$

e.  $\sec 210^\circ$

c.  $\csc \pi$

f.  $\cot 150^\circ$

16. Find the value of the following expressions, in radians.

a.  $\arctan 1$

b.  $\cos^{-1}(-1/2)$

c.  $\arcsin 0$

17. Use a trigonometric identity to find an equivalent expression.

a.  $\tan^2 x + 1$

d.  $\sec x$

b.  $\frac{1}{\csc x}$

e.  $2\sin x \cos x$

c.  $\frac{\sin x}{\cos x}$

f.  $\sin^2 x + \cos^2 x$

18. Sketch a rough graph of the following functions. Do not use a graphing calculator.

a.  $y = -2x + 3$

b.  $f(x) = e^x$

c.  $f(x) = \ln x$

d.  $y = \sin x$

e.  $f(x) = \cos x$

f.  $y = \sqrt{x-2}$

g.  $y = |x+1| - 4$

h.  $y = x^2 - 3x$

i.  $f(x) = \frac{1}{x}$

**Sample review answers**

1.  $\{\frac{8}{3}\}$

2.  $x \leq -1$  or  $(-\infty, -1]$

3. a) 11, b)  $2x^2 + 11x + 5$

4. a) Dom  $g = [-\frac{9}{4}, \infty)$ ,

b) Any real number,  $x \neq 8$  and  $x \neq -3$ ,

c)  $(1, \infty)$  or  $x > 1$

5. a)  $f(-1) \approx 5$ ,

b) Approximately  $\{-2.1, 0.3, 1.9\}$

6.  $y = \frac{-5}{2}x + 1$ ,

7.  $\sqrt[4]{x+5}$

8.  $(13x+6)^{\frac{1}{2}}$

9.  $4 - \sqrt{6}$

10.  $x = \log_e 25$  or  $x = \ln 25$

11.  $e^{x+2} = 27$

12. a) -32, b)  $\frac{1}{3}$ , c) 32

13.  $\frac{2}{x^3}$

14a) {14}, b) {9, 8}, c)  $\left\{ \frac{-3 \pm \sqrt{17}}{4} \right\}$

d) {-3, 0, 3}, e) {0, 8, -3}, f)  $\{\frac{13}{4}\}$

15. a)  $\frac{1}{2}$  b) 1 c) undefined d)  $-\sqrt{3}/2$  e)

$-2/\sqrt{3}$

f)  $-\sqrt{3}$

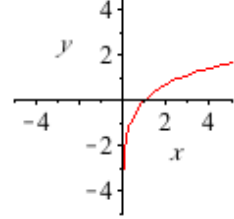
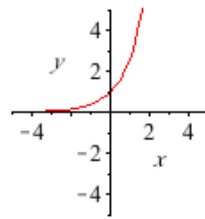
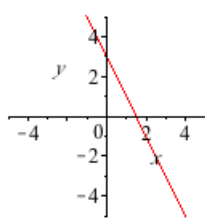
16. a)  $\pi/4$  b)  $2\pi/3$  c) 0

17. a)  $\sec^2 x$  b)  $\sin x$  c)  $\tan x$  d)  $\frac{1}{\cos x}$  e)  $\sin(2x)$  f) 1

18. a)

b)

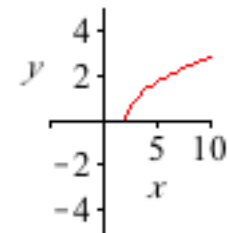
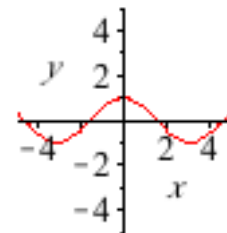
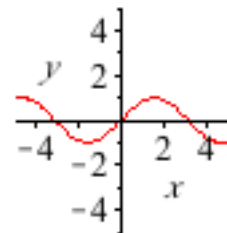
c)



d)

e)

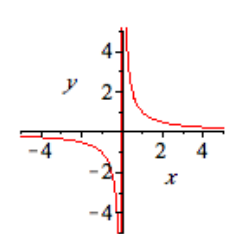
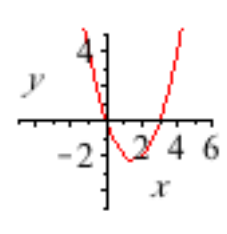
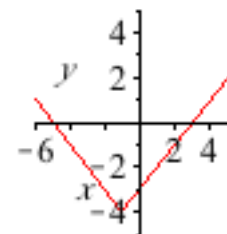
f)



g)

h)

i)



## Resources available:

- **Math Help Session** - Math Help Session will start each term in the first week of classes, in BHL 107. Schedules will be posted around Bauer Hall. During the posted hours, free tutoring is available from instructors who have volunteered their time. Also, there are video tapes and TV/VCR combos in this room, as well as computers with some tutoring programs available for help. See <http://web.clark.edu/math/helpsess.htm> for the current schedule.
- **Women in STEM Help Sessions** - like the regular help sessions but run by women instructors and specifically geared toward women students. Look for hours posted throughout Bauer or on the internet at <http://web.clark.edu/math/helpsess.htm>.
- **Tutoring/Writing Center** - Tutoring services are available free of charge to all registered Clark College students. Tutors recommended by the faculty provide help in many subject areas. 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 a TWC Annex in AA4 Rm. 106.  
(From <http://cf.clark.edu/HoursLocation/normal/tutoringCenter.cfm> )
- **Websites**
  - <http://www.purplemath.com/modules/index.htm>
  - <http://www.sosmath.com/algebra/algebra.html>
  - <http://www.interactmath.com/> - this website accompanies our Math 105/106 textbooks and contains guided tutorials for not only those classes, but also for any algebra textbook by the same publisher. (e.g. Bittinger: Elementary & Intermediate Algebra Graphs & Models, 3e ENHANCED will contain useful examples and practice problems.) ***Note:*** *the download and installation of a plug-in is required.*
- **Books for possible review**
  - Forgotten Algebra (Paperback) by Bleau,  
ISBN-13: 978-0764120084 (Available in the Clark library and bookstore.)
  - Algebra II (Cliffs Quick Review) (Paperback) by Kohn and Herzog,  
ISBN-13: 978-0764563713 (Available in the Clark library and bookstore.)
  - Schaum's Outline of Intermediate Algebra (Paperback),  
ISBN-13: 978-0070608399
  - Trigonometry (Cliffs Quick Review) (paperback) CliffsNotes,  
ISBN-0-7645-6389-0 (Available in the Clark library and bookstore) The most important topics you'll need are in Chapter 1 (everything except interpolation), Ch 2 (just solving right triangles), Ch 3 (all but the last two sections), Ch 4 (all but the last two sections), Ch 7 (all).
  - Super Review Algebra & Trigonometry (paperback) Research & Education Association  
ISBN-13-978-0-87891-177-6 (Available in the Clark library and bookstore) The most important topics you'll need are in sections 1.1-1.4, 2.3, 3.1-3.2, 4.2-4.5, 6.2-6.3, 12.1-12.2, 19.1-19.4, 21.1-21.2.