The Beacon School AP Calculus AB - Summer Assignment Mr. DiLullo

Due to the large amount of material that needs to be covered in the AB Calculus curriculum before the AP exam is taken in May, we are going to review topics over the summer that have already been covered in Precalculus, so that we can "hit the ground running" when we return to school in September.

In the table below are reading and problem-solving assignments. Be sure to look at final answers for the odd problems in the back of book; I have put answers to the even problems at the bottom of the table.If you need to see a full solution to any of the odd problems, visit www.beaconschool.org/~bdilullo/calculus-ap and look at the link for "Chapter P – Solutions" and "Chapter 1 – Solutions." If you run into difficulties with the Exercises, refer back to the Examples that are in the textbook. Also, refer to your notebook from Precalc. Also, there are lots of Calculus resources on-line (e.g., math.com has a tutorial section for Calculus) if you want to see different sources on these topics.

In the sections listed below, I have not assigned sections 1.1, and have skipped a few pages (of new material) in most sections; we will go over these sections together in September. Also, keep a rough estimate of the time you spend on each section; this will help me gauge what sections to concentrate on in September. Feel free to e-mail me (bdilullo@beaconschool.org) if you have questions.

Thank you for your commitment to this class. The time that you spend this summer reviewing this previously-learned material will benefit us greatly next year, as we prepare for the AP exam.

I am looking forward to seeing you all in September, and to a great year with you in AP Calculus!

Sec P.1	**Read** pp. 2 through 6. You can skip the Exploration section and Technology section on p.3. **Exercises**: 1-4,17(use TRACE),19,21,25,61-67 odd,77,81,82
Sec P.2	**Read** pp.10-15. You can skip the Exploration on p.11, and the Technology Pitfall on p.15. **Exercises**: 1-5 odd,23,25,31,37,43,49,59,65,97
Sec P.3	**Read** pp.19-26. You can skip the Exploration on p.23 **Exercises**: 1,2,3-9 odd,13,14,17,18,25,27,29-33,39,41,47-52,55,57,71,73 Hints: for 29-33, use parent graphs to help you graph these. For #33, it is a semi-circle (the top half of a circle of radius 3)
Sec 1.2	**Read** pp.48 through 51. On p.50, skip the paragraph in the middle of the page that starts with "This means that no matter how close *x* gets to 0, …", and the graphic underneath the paragraph (with the red rectangles and arrows). You can skip the Technology Pitfall on p.51. **Exercises**: 1, 9-15 odd,19-23,25,53,55 Hints: for #1, enter the function in your calculator in the "Y =" window. Then, graph the function and use the TRACE feature: type the number like 1.9 then press Enter; then the calculator will display the Y-value. For 9-15, just look at the picture to figure out the answer. over…

Sec 1.3	**Read** pp.59 & 60 (on p.59, you can skip the Proof; Theorems 1.3 & 1.4 are saying that polynomials, rational & radical functions are pretty straightforward if you want to find a limit: just plug in *c* (but, be careful… for rational functions, just make sure that the denominator doesn't end up equaling 0). **Read** pp.61 – 66 (on p.61: skip from the top of the page through the end of Ex.4, and you can skip "Technology Pitfall" on p.63, and the Proof on p.65. You won't be responsible for the details of The Squeeze Theorem, but we will discuss how the theorem works at our special class in June) In Exs 9 & 10 on p.66, notice how they manipulate the function, so it includes the Special Limit from Th.1.9 **Exercises**: 5-13 odd, 27,29,33,37,41-61 odd, Hints: for 27-33, don't use a calculator (practice your trig). If you don't have these values of special trig angles memorized, please do so – we use them a lot in Calculus, and I will always assume that you know them, without any forewarning.
Sec 1.4	**Read** pp.70-73 (you can skip the bottom half of p.72 (about step functions, and Ex.3) **Read** pp.75-76 (on p.76, just read Ex.7, part a) **Exercises**: 1-11 odd,25,29-47 odd,57,59,89 Hints: For #29, it is a semi-circle (the top half of a circle of radius 5)
Sec 1.5	**Read** pp.83-87 (you can skip the "Definition of Infinite Limits" on p.83, the Exploration on p.84, and the Proof on p.87) **Exercises**: 1-21 odd,27-41 odd,55 Hints: For 1 & 3, just look at the picture. For 5 & 7, enter the function in your calculator in the "Y =" window. Then, graph the function and use the TRACE feature: type the number like -3.5 then press Enter; then the calculator will display the Y-value. For #29, it is a semi-circle (the top half of a circle of radius 5)
Sec 3.5	**Read** pp.198-201,204 (you can skip the "Definition of Limits at Infinity" and the paragraph underneath it, on p.198. For Ex. 2 on p.200, Ex.3 on p.201 & Ex.8 on p.204, we learned a shortcut to do these types of rational function problems (just compare the degrees of the numerator & denominator…). Look at the technique that the book uses, as a formal and more proof-like approach to the problem. We will discuss this approach at our class in June. We will use the shortcut as a quick way to solve the problem. But, we should understand the proof-like approach, as an alternative and more proper "calculus method." **Exercises**: 1,9-25 odd, 31,33 Hint: For #9-13, it will be much faster to use the TRACE (or TABLE) feature of your calculator. You can solve #21 & 25 by comparing degrees of numerator & denominator; in addition, try solving them a *second* way, by using the more formal method used in Ex.2 on p.200 (for #21)& Ex.8 on p.204 (for #25). (In Ex.2, there is a nice description of the method in the margin ("you should divide the numerator & denominator by the highest power of *x* in the *denominator*").
Answers to Evens	P.1: 82) True P.3: 2a) D of f: [-5,5], R of f: [-4,4], D of g: [-4,5], R of g: [-4,2] 2b)f(-2)=-2, g(3)=2 2c) x=-2 and x=4 2d) x=-4 and x=4 2e) x=-1 14) D: $(-\infty,\infty)$ R: $[-5,\infty)$ 18) D: $(-\infty,1)\cup(1,\infty)$ R: $(-\infty,0)\cup(0,\infty)$ 30) D: $(-\infty,0)\cup(0,\infty)$ R: $(-\infty,0)\cup(0,\infty)$ 32) D: $(-\infty,\infty)$ R: $(-\infty,\infty)$ 48) b 50) a 52) c 1.2: 20a) does not exist (dne) b) dne c) f(0)=4 d) dne e) dne f) 4 g) f(4)=2 h) dne 22) the limit exists for all values of c, except c = -2