1 This list is not in final form. Like, stuff may yet be added to it.

2 Test #2 is

Wednesday
3/19/08.

3 The test will cover the material of Assignments #10 – #15. roughly, that is, sections 2.1-2.7.

No calculator part this time.

4 Topic List

Major errors on the 3/14/08 in-class quiz:

(i) \((3x - 2)^2 = 9x^2 + 4\) or \((3x - 2)^2 = 9x^2 - 4\). We should not be seeing this one in MATH 143. Try to get the RIGHT habit here!

(ii) \(- (9x^2 - 12x + 4) = - 9x^2 - 12x + 4\). This “distribute-the-minus” error is also one that should be never seen in MATH 143.

If anyone has any suggestions as to how to make these go away from the general population, please pass them on!

Section 2.1:

(i) Given a formula for \(f(x)\), simplify \(f(x^2)\), \(f(-x)\), \(f(x+h)\), \(f(x+3) + f(5-2x)\), \(f(x+3)f(5-2x)\), and \(\frac{f(x^2 - 4)}{f(x+2)}\)

(ii) Difference quotients: you need to know the formula for the difference quotient

\[
DQ = \frac{f(x + h) - f(x)}{h}
\]

and how to simplify it until the denominator \(h\) cancels out: click here for a practice problem set and here for an answer key.

Section 2.2:

Know the page-166 table cold.
Section 2.3:

(i) Know the formula for the \textit{Average Rate of Change} of $f$ on the interval $[a, b]$.

(ii) Know the \textbf{Difference-Quotient} formula.

Section 2.4:

(a) The transformations: how are the two graphs related?

(i) $y = f(x)$ and $y = f(x + 2)$
(ii) $y = f(x)$ and $y = f(x) + 2$
(iii) $y = f(x)$ and $y = f(x - 2)$
(iv) $y = f(x)$ and $y = f(x) - 2$
(v) $y = f(x)$ and $y = f(-x)$
(vi) $y = f(x)$ and $y = -f(x)$
(vii) $y = f(x)$ and $y = f(2x)$
(viii) $y = f(x)$ and $y = 2f(x)$
(ix) $y = f(x)$ and $y = f(x/3)$
(x) $y = f(x)$ and $y = f(x)/3$

(b) Be able to give the formula, in terms of $f$, for the function whose graph comes from
the graph of $f$ via

(i) stretching away from the $y$-axis in the $x$ direction by a factor of 3.
(ii) stretching away from the $x$-axis in the $y$ direction by a factor of 3.
(iii) squeezing toward from the $y$-axis in the $x$ direction by a factor of $1/3$.
(iv) squeezing toward from the $x$-axis in the $y$ direction by a factor of $1/3$.
(v) shifting right by 2.
(vi) shifting left by 2.
(vii) shifting upward by 2.
(viii) shifting downward by 2.
(ix) reflecting over the $x$-axis
(x) reflecting over the $y$-axis
(xi) reflecting over the line $x = 4$
(xii) reflecting over the line $y = 4$
(xiii) reflecting over the line $y = x$

Section 2.5:
Section 2.6:
Section 2.7:

5 Suggested Problems

(i) Expand and collect $10 - (3 - (5 - x)^2)^2$, sort the terms of your result in descending powers of $x$, then email it to the instructor with subject line

\[ \text{MATH 143 Expand and Collect.} \]

(ii) Distribute that Minus: Page 31: 11

(iii) Distribute that Minus: Page 32: 83, 97

(iv) Section-2.4 transformations: Page 235: 47, 48

(v) Transformed page-166 graphs: Page 234: 15-28

(vi) Compositions: Page 236: 63e, 63f, 65

(vii) Difference quotients: you need to know the formula for the difference quotient

\[ DQ = \frac{f(x + h) - f(x)}{h} \]

and how to simplify it until the denominator $h$ cancels out: click here for a practice problem set and here for an answer key.

(viii) Quadratic extremes and graphs: Page 235: 53 and 55. And page 234: 19

(ix) Maximum area: Page 212: 29

6 On page 237 is a purple-page “test” which has a full answer key in the back of the book. All of the purple-page problems are fair game, except 10, 11, 12. Problems 10 and 11 might be moved to the fair-game collection later.

The notes below are from previous semesters.

7 Comments on problems in the MATH-143 Test #2 for 10/26/05. Note that it now has a putative answer key.

- Problem 1 can be carried out 95% of the way by algebra.
• Problem 3. Note that the formula for $T I$ is given. You are supposed to know the formula for $DQ$.

• Problem 4 (a) and (b) and maybe (c) if we get into section 2.8.

• Problem 5 (b), (c), and (d) on the section-2.4 transformations of page-166 graphs.

• Problem 6 on Ungraphing.

• Problem 7 on Sesame-Street Microeconomics. In part (a), you get to cook up your own demand curve. Otherwise, problem 7 is the same gig as the Interocitor problem presented in class.

8 The MATH-143 Test #1 for 9/27/02 problems relevant to us at our current stage:

• Problem 3 on piecewise functions.

• Problem 4 on ungraphing.

• Problem 6 on graphing using page 166 and the section-2.4 transformations.

• Problem 7 on $DQ$. Things were easier in 2002: they give you the $DQ$ formula. You, in 2008, have to know the $DQ$ formula.

• Problem 8: graph the parabola

• Problem 9: matching about the section-2.4 transformations.