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# Multivariable Calculus

Math 212 §2 Fall 2014  
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Fowler 309 MWF 11:45am - 12:40pm  
<http://faculty.oxy.edu/ron/math/212/14/>

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## Worksheet 13

**TITLE** Review for Exam 1

**CURRENT READING** McCallum, Section Chapter 12, Chapter 13, Section 14.1-14.5, 17.1

**HW #6 (DUE WEDNESDAY 10/08/14)**

McCallum, *Section 14.6*: 4, 11, 12, 26, 34, 35, 47\*.

McCallum, *Section 14.7*: 6, 7, 8, 12, 19, 24, 30, 31, 41\*.

McCallum, *Section 14.8*: 3, 12, 19\*.

McCallum, *Chapter 14*: 2, 14, 35, 45, 64\*

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### SUMMARY

This worksheet reviews the concepts that you need to be responsible for on Exam #1.

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Here are the titles of the first 12 Worksheets of the class.

**\* means Exam 1 will not cover this material**

**Worksheet 1** *Introduction to Vectors (Notation and Terminology)*

**Worksheet 2** *The Dot Product and Vector Equations of Lines and Planes*

**Worksheet 3** *Vector Projection and the Vector Cross Product*

**Worksheet 4** *Functions, Vector Functions, and  $f(x, y)$  as surfaces*

**Worksheet 5** *Cross-Sections and Level Sets*

**Worksheet 6** *Limits of Multivariable Functions*

**Worksheet 7** *The Partial Derivative*

**Worksheet 8** *The Tangent Plane, Differentials, and Linear Approximations*

**Worksheet 9** *The Directional Derivative and the Gradient Vector*

**Worksheet 10** *The Gradient Vector in  $\mathbb{R}^3$*

**Worksheet 11** *The Chain Rule\**

**Worksheet 12** *Second-Order Partial Derivatives\**

Here are the Surfaces activities covered

**Activity 1** The Surface (Functions of Two Variables)

**Activity 2** The Park (Level Sets)

**Activity 3** The Hillside (The Gradient Vector)

Here are the titles of the Quizzes we have done so far in the class

**Quiz 1** *Vectors and Lines in  $\mathbb{R}^4$*

**BONUS 1** *Planes and the Cross Product*

**Quiz 2** *Multivariable Functions*

**Quiz 3** *Application of Partial Derivatives*

**BONUS 2** *Understanding Partial Derivatives*

**Quiz 4** *Gradient Vector and Directional Derivatives*

Here are the Chapters we have covered in the textbook, *Calculus : Multivariable (6th Edition)*, so far

**\* means Exam 1 will not cover this material**

**Section 12.1** *Functions of Two Variables*

**Section 12.2** *Graphs and Surfaces*

**Section 12.3** *Contour Diagrams*

**Section 12.4** *Linear Functions*

**Section 12.5** *Functions of Three Variables*

**Section 12.6** *Limits and Continuity*

**Section 13.1** *Displacement Vectors*

**Section 13.2** *Vectors in General*

**Section 13.3** *The Dot Product*

**Section 13.4** *The Cross Product*

**Section 14.1** *The Partial Derivative*

**Section 14.2** *Computing Partial Derivatives Algebraically*

**Section 14.3** *Local Linearity and the Differential*

**Section 14.4** *Gradients and Directional Derivatives in the Plane*

**Section 14.5** *Gradients and Directional Derivatives in Space*

**Section 14.6** *The Chain Rule\**

**Section 14.7** *Second-Order Partial Derivatives\**

**GROUPWORK**

What topic(s) are the most unclear right now?

Which topic(s) do you have the most confidence in answering questions on?