

MCV 4U Vectors Exam Information

Date: Tuesday, November 20th

Length: 75 minutes (You can start at 7:45 if you want to, leaving you with almost 120 minutes)

Material Covered: GA1 & GA2 (Chapters 6 & 7), GA3 & GA4 (Chapters 8 & 9)

Portion of Grade: 14.4% (48% of 30%)

Questions to Expect:

Vectors and Their Applications (GA1 and GA2)	<ul style="list-style-type: none"> • Use diagrams to explain a geometric property of vectors (scalar multiplication, addition, commutative or associative property, etc.) • Word problem involving vector addition (forces, velocity, etc.) • Plot a point in R^3 and label the coordinates of the prism produced. • Simplify an expression using algebraic vectors. • Identify the standard basis vectors in R^2 and R^3 and explain what they represent. • Determine if three vectors are coplanar or not. • Calculate the dot product, cross product, scalar and vector projections, and direction cosines given two vectors.
Equations and Intersections of Line and Planes (GA3 & GA4)	<ul style="list-style-type: none"> • Write vector, parametric, and Cartesian equations for a line in R^2, and make connections to the equations of a plane in R^3. Explain what a normal vector is here. • Write the symmetric equation for a line in R^3 and explain why you cannot write a Cartesian equation. • Explain how the equation of a plane is related to linear combinations, and then write an equation for a plane in vector, parametric, and Cartesian form. • Find the angle between two intersecting planes. • Question asking about the types of intersections for lines, planes, etc. • Determine values of k, a, b, etc. that create coincident or parallel lines/planes. • Solve a system of three equations in three unknowns using a matrix. Interpret your solution. • Identify the type of intersection for three planes without solving, and explain your reasoning. • Find the distance between two lines in R^3. • Find the distance from a point to a plane.

Preparation

You will have two class periods to prepare for this exam (November 14 and 19), with a long weekend in between them (November 16 – 18). If you use your class time effectively and put in a little bit of effort over the weekend you should be ready, as long as you apply quality study strategies. PLEASE WORK TO UNDERSTAND THE THEORY so that you select appropriate strategies to solve problems. If time continues to be an issue for you, this is likely the root cause. Specific things that you can try are:

- Reviewing and summarizing your notes, explaining the concepts in your own words. Focus on the topics that keep coming up again (cross product, applications of the dot product, forms of equations, etc.)
- Completing or copying examples from the notes, and then annotating your work explaining why we did what we did.
- Reflecting on the errors that you made on your tests. Whether they were “silly” mistakes or not, they happened. You need to identify WHY they happened so that you can learn from them!
- Redo your tests and quizzes, and again go through your solutions and explain (in writing or to a friend) WHY you did what you did.
- Try some homework questions in the areas that you weren’t sure about AFTER you have studied and improved your understanding.
- Select problems from the Cumulative Review of Vectors (p. 557 – 560) that seem relevant to this outline. Remember that your text book sometimes likes to overcomplicate the review questions, so don’t get too stressed out over problems you’ve never seen before.

All distance formulas will be provided, along with those for projections and the geometric dot product.