**MCV 4U Learning Goals and Success Criteria**
**Chapter 6: Introduction to Vectors**

**Learning Goals**

I will be able to represent vectors in $R^2$ and $R^3$ algebraically and geometrically and recognize their applications. (GA1)
I will be able to perform operations on vectors in $R^2$ and $R^3$ and use the properties of these operations to solve problems. (GA2)

**Success Criteria**

I can:

- Recognize a vector as a quantity with both magnitude and direction and identify real life applications of vectors. (GA1)
- Represent a vector in $R^2$ geometrically and algebraically and recognize equal vectors as those with equal magnitude and direction, regardless of position. (GA1)
- Use trigonometric relationships to determine the Cartesian representation of a vector in $R^2$. (GA1)
- Recognize that points and vectors in $R^3$ can both be represented by Cartesian coordinates and find the magnitude of a vector using those coordinates. (GA1)
- Perform addition, subtraction, and scalar multiplication on vectors in $R^2$ and $R^3$ given geometric or algebraic representations, and solve problems using these operations. (GA2)
- Determine some properties of these operations on vectors (commutative, associative, etc.). (GA2)

**Test Information:**

Your test is Tuesday, April 14th. You will need to log in to Microsoft Teams to do it, and you will be given 1 hour and 45 minutes to complete it (either by printing and handwriting and then sending it back as pictures, or scanning it OR by downloading the PDF and writing on it directly using a tablet if you have the tools to do so). I suggest staying logged in to teams for the duration so that I can answer your questions as they come up. We are all learning, so be patient!

There is a more detailed test outline below. These are the types of questions you can expect. To prepare well for this test, you should (in this order):

- Review your notes and makes study notes. We learned new vocabulary, so be sure that you actually understand it!
- Review/redo your quiz (if you don't have one yet, I will send you a copy if you ask) and go through the examples in the notes and be sure that you can do them yourself.
- Complete questions in the suggested review that you think you need to do. **The text book should be your last stop, not your first!**

**Questions to Expect**

- Explain the difference between a vector and a scalar quantity.
- Given a diagram, identify equivalent and opposite pairs of vectors and explain your thinking.
- Short answer question about the triangle law and the parallelogram law for vector addition.
- Calculate the magnitude and direction of a given geometric vector using trigonometry (see quiz!)
- Use diagrams to show a vector property. Explain your thought process and name the property.
- Write vectors in terms of other vectors (see #9 and 10 on p. 307)

- Plot a point and a position vector in $R^3$.
- Use give coordinates for A and B to find the coordinates for position vector AB, then express it in terms of the standard basis vectors and find its magnitude and direction.
- Given a set of vectors (x, y, z), determine the resultant vector of a combination of those vectors (distributive property and addition/subtraction).
- Determine if three vectors are coplanar and explain your reasoning.
- Write a given vector as a linear combination of two other given vectors.
- Explain some theory from 6.8.

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| Text book Questions: | The review is long. I have selected some questions that might be relevant, but focus on notes, your quiz, homework, etc. The Chapter Test is actually a little more useful than the review.<br>p. 344 #2 – 4, 6, 8, 9, 11, 14 – 16, 18, 19, 23; p. 348 #1, 2, 4 – 7 |