Written HW3 – MATH 3503 Fall 2020

Due by Monday, 24 August for timely completion credit

1. Let $\vec{a} = \langle 1, 5, 3 \rangle$ and let $\vec{b} = \langle -1, 2, 5 \rangle$. Compute $3\vec{a} - 2\vec{b}$.

2. Sketch a picture of $\vec{a} = \langle 1, 2 \rangle$ and place $\vec{b} = \langle -1, 5 \rangle$ in the same picture. In your sketch (or a second one), draw the vector addition $\vec{a} + \vec{b}$ by attaching them correctly and drawing the sum as a dashed line.

3. Find all t such that $\langle t, \sqrt{t+1} - 1 \rangle = \langle t, t \rangle$.

4. Plot the point $A = (1, 1)$. Place a point $B = (x, y)$ anywhere else in the plane. Draw the vector $\overrightarrow{AB}$. Describe in words what is happening as the point B moves around the plane.

5. Let $A = (1, 0, 0)$ and $B = (0, 0, 1)$ be points in $\mathbb{R}^3$. Use 3D axes drawn in the same way as was done in the 17 August 2020 notes (page 5), plot A and B on your graph, and then sketch the vector $\overrightarrow{AB}$. Describe what difficulties you would have if you tried to do a similar thing with the points $(1, 0, 0, 0)$ and $(0, 0, 0, 1)$ in $\mathbb{R}^4$.