Calculus 3 June 14, 2016

1. Use the right hand rule to create a 3D System with the y-axis extending to the right edge of the paper.
2. Use the right hand rule to create a 3D System with the y-axis extending to the left edge of the paper.
3. Use the right hand rule to create a 3D System with the x-axis extending to the right edge of the paper.
4. Plot $(-1, 2, 4)$ on 2 of the above 3D Systems.
5. Let $a =< -2, 3 >$ and $b =< 4, -1 >$, find $a + b$ and $b - a$ and $2a + b$.
6. Graph the vectors a, b, and $2a + b$
7. What would the function $x^2 + y^2 = 1$ look like on a 3D System.
8. Find the vector $\vec{AB}$ is $A = (2, 3, 1)$ and $B = (-1, 2, 3)$.
9. Find the magnitude of the above vector $\vec{AB}$.
10. Let $\vec{u} =< 1, -2, 4 >$, find the unit vector associated with this vector.
11. Find two points on the plane $x + y + z = 3$ that are equidistant from the point $(0, 0, 0)$.
12. Let $c =< 1, 3, -2 >$ and $d =< -2, 0, 3 >$, find $c \cdot d$.
13. Find the angle between c and d.
14. A child pulls a red wagon a distance of 150m by exerting a force of 200N and did 20000J of work. At what angle was the child holding the handle of the angle?
15. Find the vector projection of $< 0, 0, 1 >$ onto $< 2, 0, 4 >$.
16. Find the vector projection of $< 1, 1, 1 >$ onto $< 3, 2, -1 >$.
17. Find the vector projection of $< 2, 0, -1 >$ onto $< -4, 0, 2 >$.
18. Find a vector that is perpendicular to $< 1, 2, -1 >$
19. What is the dot product between $i =< 1, 0, 0 >$ and $j =< 0, 1, 0 >$?
20. What is the dot product between $k =< 0, 0, 1 >$ and $j =< 0, 1, 0 >$?
21. What is the dot product between $k =< 0, 0, 1 >$ and $i =< 1, 0, 0 >$?
22. True or False i, j, and k are all perpendicular to each other.
23. Are i, j, and k unit vectors? Plot each of these vectors on a 3D System.