Name:__________________________________

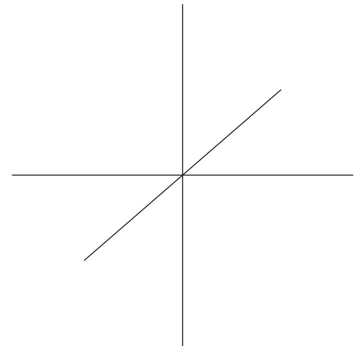
Exercise 1 Find vector, parametric, and symmetric equations of the line that passes through the points $A = (2, 4, -3)$ and $B = (3, -1, 1)$.

Exercise 2 Find an equation of the plane that contains the point $(-2, 3, 1)$ and is parallel to the plane $5x + 2y + z = 1$.

Exercise 3 Classify $x^2 + 2z^2 - 6x - y + 10 = 0$ as either a cone, elliptic paraboloid, ellipsoid, hyperbolic paraboloid, hyperboloid of one-sheet, or hyperboloid of two sheets. You should look up the generalized equations of these surfaces and then use completing the square to figure out which of these forms the above equation is. Give details in your description as to the orientation, center, and how much the shape has been stretched.

Exercise 4 Plot the points whose coordinates are given, then find the rectangular coordinates of the point.

a. $(3, \frac{3\pi}{4}, -2)_C$ (this is in cylindrical coordinates)



b. $(2, \frac{\pi}{2}, \frac{\pi}{4})_S$ (this is in spherical coordinates)

Exercise 5 Change the point $(1, -1, 4)$ from rectangular coordinates to cylindrical and spherical coordinates.

Exercise 6 Use the form of the definition of the integral using a Riemann Sum and a limit to evaluate the integral

$\int_0^2 (2x - 1)dx.$

Note: You are NOT to use the anti-derivative and the evaluation theorem. [Hint: $\Delta x = \frac{b-a}{n}$, $x_i = a + \Delta x \cdot i$, and $\int_a^b f(x)dx = \lim_{n\to\infty} \sum_{i=1}^{n} f(x_i)\Delta x$]