Math 32A, Winter 2019 WS - Week 1 Full Name:

1. Introduce yourself to your group. Write down each of their names here:

   These are great people to study with!

2. Consider the equation $y = 5$.
   (a) Sketch the graph of the equation in $\mathbb{R}^2$.

   (b) Sketch the graph of the equation in $\mathbb{R}^3$.

3. Consider the equation $y = x$.
   (a) Sketch the graph of the equation in $\mathbb{R}^2$.

   (b) Sketch the graph of the equation in $\mathbb{R}^3$.

4. Consider the equation $y = x^2$.
   (a) Sketch the graph of the equation in $\mathbb{R}^2$.

   (b) Sketch the graph of the equation in $\mathbb{R}^3$.

5. Write the equation of each of the following shapes and sketch their graphs (you may look them up in your book or online if you need to). These are called conic sections because they can be obtained as slices of a cone.

   (a) A parabola that opens downward and interstects the x-axis at $x = 0$ and $x = -2$.

   (b) A circle centered at the origin with radius r.

   (c) An ellipse in standard position that intersects that x-axis at $x = \pm a$ and the y-axis at $y = \pm b$.

   (d) A hyperbola in standard position that intersects the x-axis at $x = \pm a$.

6. Sketch the graphs of the following equations in $\mathbb{R}^2$. Label intersections with the axes.

(a) $3x^2 + 3y^2 = 9$

(b) $-4x + 8y^2 = 4$

(c) $4x^2 - 9y^2 = 12$

(d) $4x^2 + 9y^2 = 12$

(e) $4x^2 - 9y^2 = -12$

(f) What do each of these graphs look like in $\mathbb{R}^3$?