Your Name: _____

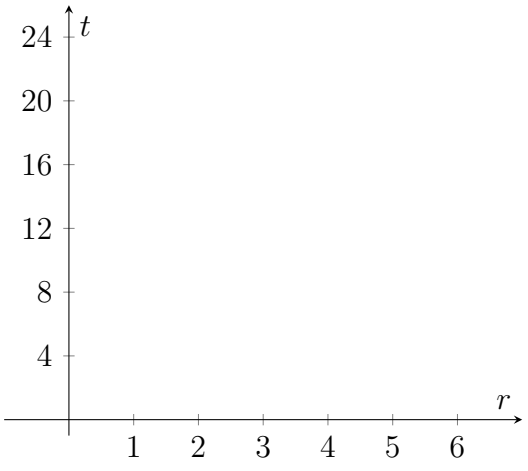
1. Show calculations to verify that for $f(x, y) = x^2 + 3xy$, we get $f(-1, 2) = -5$.

2. Describe the domain of $f(x, y) = \dfrac{x^2 + y^2}{3 - x - y}$ in terms of a region (or regions) in the xy-plane.

3. The total number of files read for applicants to an MBA program is given by $F(r,t) = 6rt$, where r is the number of reviewers reading the files, and t is the number of hours spent reading files.

   (a) Compute and interpret the value of $F(4,3)$ in context. ("Interpret in context" means to write a complete sentence that includes a description, with units, of what the numbers 4, 3, and $F(4,3)$ mean in terms of files read, reviewers, and/or time)

   (b) Sketch the graph of the level curve of $z = F(r,t)$ at $z = 72$ by plotting the points from the table. (Hint: first solve the equation for t in order to match the axes in the coordinate plane below)



r	t
0.5	
1	
2	
4	
6	

   (c) Interpret what the points on the level curve $F(r,t) = 72$ represent in context.

4. A local market carries two popular brands of energy drink; Red Bull sells for b dollars per case and Monster sells for m dollars per case. Sales figures indicate that the demand for Red Bull will be $B(b, m) = 70 - 2b + m$ cases per week and the demand for Monster will be $M(b, m) = 100 + 2b - 4m$ cases per week.

   (a) Suppose that you sell Red Bull at \$19 per case and you sell Monster at \$15 per case. How much revenue is generated from Red Bull? How much revenue is generated from selling Monster? (Recall that revenue for an item is the product of its unit price with its quantity sold)

   (b) Express the market's *total* revenue for a week, R, from the sale of Red Bull and Monster as a function of b and m. The total revenue is the sum of the individual revenues.