

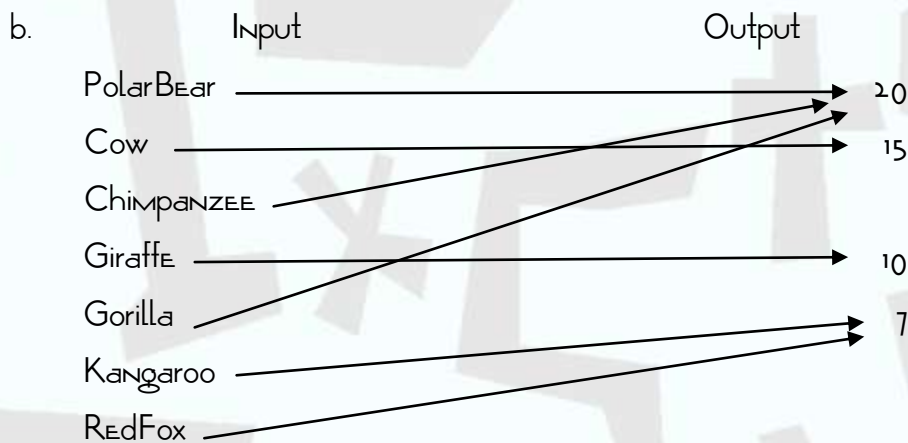
NAME _____

Homework #4, Math 102, Fall 2008

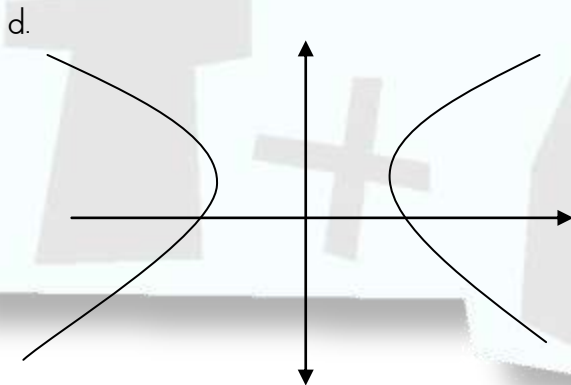
Instructions: Put all answers on the homework sheet and attach pages to show work. All work must be shown to receive credit. All answers must be exact unless otherwise indicated. Simplify answers as much as possible, even if not specifically noted.

1. Determine whether the following relations are functions. If not, give at least one example of an input-output pair that proves it. List the domain and range of each.

a. $\left\{ \left(\frac{3}{2}, \frac{1}{2} \right), \left(1\frac{1}{2}, -7 \right), \left(0, \frac{4}{5} \right) \right\}$



c. Input: Numbers of children $\{0, 1, 2, 3, 4, \dots\}$
Output: First 1000 couples at a baseball game



e. $y = 1$

f. $x = \frac{y}{x-3}$

g. $x = |y|$

2. Find the following values for each of the functions below: i. $f(-1)$, ii. $f(2)$, iii. $f\left(\frac{3}{2}\right)$, iv. $f(-1.4)$.

a. $f(x) = 2x^2 + 4$

b. $f(x) = -x^2 - 2x$

c. $f(x) = 1.3x - |7.1x - 0.65|$

3. For the function $f(x) = x^3 + 3x^2 + 1$, find all the values where $f(x) = 3$ (there may be more than one).

4. Give an equation of a graph with the following properties. Each lettered list of properties, requires one equation each.

a. A vertical line

b. A line that goes from the bottom left to the top right.

c. A line that goes from the top left to the bottom right

d. A horizontal line

e. A line which passes through the origin

f. A line passing through the point $(0,1)$ with a slope of 3.

- g. A line passing through the point $(6, 7)$ with an undefined slope.
- h. The line passing through the points $(-1, 3)$ and $(4, 2)$.
- i. Any line parallel to $7x - 3y = 21$.
- j. Any line perpendicular to $-5x + 9y = 17$.
5. State the slope and x - and y -intercepts of the lines:
- a. $3x - 4y = -6$
- b. $f(x) = 4x - \frac{1}{3}$
- c. The line passing through $(-2, -5)$ and $(3, -5)$.
6. Write three different versions of the equation of a line and explain when you use each.
7. What is the difference between a slope of zero and an undefined slope?
8. The yearly cost of tuition and required fees for attending a public two-year college full-time can be estimated by the linear function $f(x) = 53.6x + 849.88$ where x is the number of years after 1990 and $f(x)$ is the cost.
- a. Find and interpret the slope.
- b. Find and interpret the y -intercept.