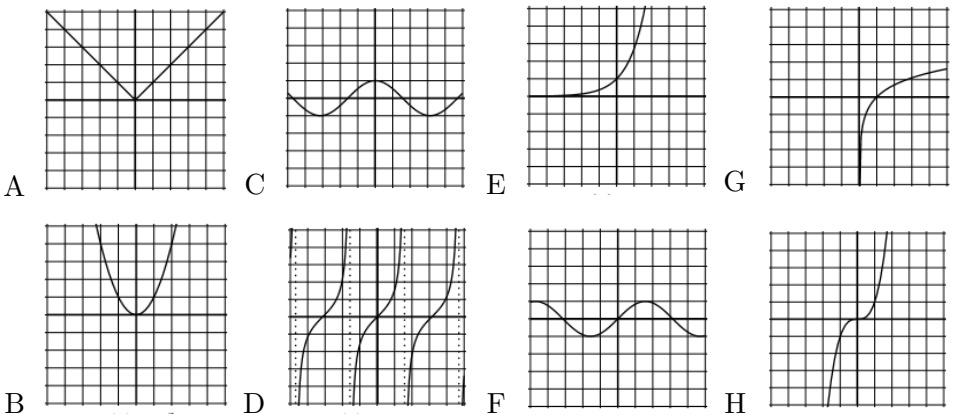
Math 171 Group Review over Graphing (1.1/1.3) Name _____
August 27, 2018
Credit given for work shown.
No calculators needed.

1. Match the graphs with their corresponding functions.



$y = |x|$_____

$y = e^x$_____

$y = \cos(x)$_____

$y = x^2$_____

$y = \tan(x)$_____

$y = \ln x$_____

---

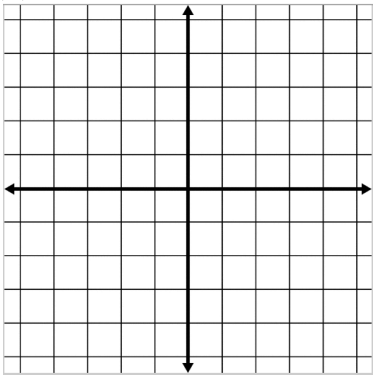
2. Consider the function: $f(x) = x^3 - 4x^2$. Do NOT use a calculator.
   (a) Find the zeros (roots) of the function.

   (b) State the <u>mathematical definition</u> for an odd function.

   (c) State the <u>mathematical definition</u> for an even function.

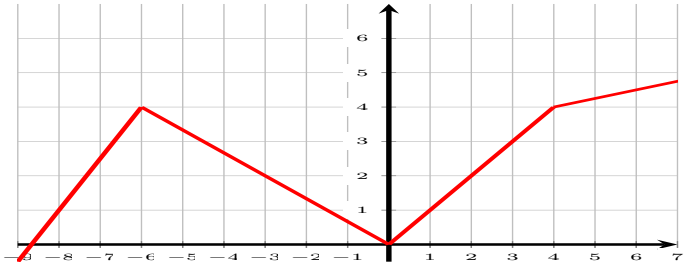
   (d) Determine if the function has even, odd or neither symmetry.

   (e) Sketch its graph by using info from parts (a) and (d) and by plotting points.



3. Circle all of the true statements.
   (a) The product of two even functions is even.
   (b) The product of an even and an odd function is odd.
   (c) The sum of an even and odd function is odd.
   (d) The quotient of two odd functions is even.
   (e) Squaring an odd function results in an even function.

4. In the graph to the right, find an integer value of x that satisfies the equation $f(x) = f(x+9)$?



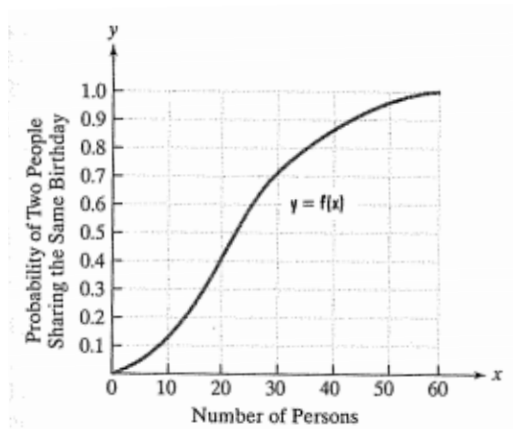
5. The graph of the parabola represented by the function $f(x) = (x+2)^2 + 3$ is reflected about the $x-$axis and then about the $y-$ axis. If $g(x)$ represents the new parabola, which of the following is a correct representation of $g(x)$?

(a) $g(x) = (x-2)^2 + 3$
(b) $g(x) = -(x-2)^2 + 3$
(c) $g(x) = -(x-2)^2 - 3$
(d) $g(x) = -(x+2)^2 + 3$
(e) $g(x) = (x-2)^2 - 3$
(f) $g(x) = (x+2)^2 - 3$

6. The graph represents the probability of two people in the same room sharing a birthday as a function of the number of people in the room. Call the function f.

(a) Explain why f has an inverse function.

(b) Describe in practical terms the meaning of $f^{-1}(0.7)$.



7. In 1941 British physicist G.I. Taylor noted that the radius R of the blast of a nuclear explosion should initially depend only on the energy E of the explosion, the time t after the detonation, and the density of the air. The only number having dimensions of length that can be constructed from these quantities is:

$$R = S\left(\frac{Et^2}{\rho}\right)^{\frac{1}{5}}$$

where S is a dimensionless parameter.

(a) Assuming the above function for the radius of the blast as a function of energy E, $R(E)$, find the inverse function function $E(R)$.

(b) What is the domain of the inverse function?

(c) Describe in practical terms the meaning of the inverse in this situation.