- **6.** [10 points] For parts (a)–(d), indicate if each of the following statements is true, false, or if there is not enough information, by circling the correct answer. **Provide a** *brief* explanation of your answer.
 - **a**. [2 points] If the function f(x) is odd, then the function $q(x) = (f(x))^2$ is even.

TRUE FALSE NOT ENOUGH INFORMATION

Explanation: $q(-x) = (f(-x))^2 = (-f(x))^2 = (f(x))^2 = q(x)$

b. [2 points] The function log(x) can't take negative numbers as inputs, but it can have negative numbers as outputs.

TRUE FALSE NOT ENOUGH INFORMATION

Explanation:

The function $\log(x)$ is the inverse function of 10^x . Since 10^x can take negative numbers as inputs, $\log(x)$ can give negative numbers as outputs. However, since 10^x can never give negative numbers as outputs, $\log(x)$ can never take negative numbers as inputs.

c. [2 points] The function $f(x) = \log(x-h) + k$, where h, k are some constants, has a vertical asymptote at x = h.

TRUE FALSE NOT ENOUGH INFORMATION

Explanation:

Because $\log(x)$ has a vertical asymptote at x = 0, and $f(x) = \log(x - h) + k$ is the graph of $\log(x)$ shifted right h and up k, it follows that f(x) has a vertical asymptote at x = h. (Note that this is even true if h is a negative number, we just shift "right" by a negative number, so actually shift left.)

d. [2 points] If Q(t) is an exponentially growing function, then the time it takes for the quantity to double gets shorter and shorter as time goes on.

TRUE FALSE NOT ENOUGH INFORMATION

Explanation:

Any exponentially growing function has a constant doubling time, so it's doubling time does not get shorter and shorter.

e. [2 points] On each set of axes below, a solid function and a dashed function are plotted. Dotted lines represent vertical or horizontal asymptotes.



For which pairs of functions shown is the solid function the inverse of the dashed function? *Circle all that apply. No justification required.*

I II III IV