3. [8 points] **You do not need to show any work for this problem**.

a. [2 points] Which of the following functions dominates **all** the others as $x \to \infty$? **Circle exactly one of the options below**.

$f(x) = 0.01(1.3)^x$ $\quad$ $g(x) = 100x^{10}$ $\quad$ $h(x) = 300(0.25)^x$

$i(x) = 4^{-2x}$ $\quad$ $j(x) = 300\ln(4|x|)$ $\quad$ $k(x) = 100\left(\frac{6}{5}\right)^x$

b. [2 points] Which of the following functions dominates **all** the others as $x \to -\infty$? **Circle exactly one of the options below**.

$f(x) = 0.01(1.3)^x$ $\quad$ $g(x) = 100x^{10}$ $\quad$ $h(x) = 300(0.25)^x$

$i(x) = 4^{-2x}$ $\quad$ $j(x) = 300\ln(4|x|)$ $\quad$ $k(x) = 100\left(\frac{6}{5}\right)^x$

c. [2 points] Let $f(x)$ be an odd function with:

$$\lim_{x\to -3^+} f(x) = -\infty \qquad \text{and} \qquad \lim_{x\to -3^-} f(x) = \infty$$

Suppose that $f(3) = 0$. Evaluate $\lim_{x\to 3^-} f(x)$. Write your answer *in the space provided*. If there is not enough information to evaluate the limit, write NOT ENOUGH INFORMATION.

$\lim_{x\to 3^-} f(x) =$ _____

d. [2 points] Consider the functions:

$$f(x) = 1 + \sqrt{1+x}$$
$$g(x) = 1 + x$$

Find the formula of a function $h(x)$ for which $f(x) = g(h(x))$. Write your answer *in the space provided*.

$h(x) =$ _____