12. [10 points] Consider the functions f, g, and h defined as follows:

$$f(x) = a + bx \qquad g(x) = cx^d \qquad h(x) = w(1+r)^x$$

for nonzero constants a, b, c, d, r, and w with $r > -1$.

For each of the questions below, circle all the correct answers from among the choices provided, or circle NONE OF THESE if appropriate.

a. [2 points] The graph of which function(s) definitely has at least one horizontal intercept?

$f(x)$ $g(x)$ $h(x)$ NONE OF THESE

b. [2 points] The graph of which function(s) definitely has at least one horizontal asymptote?

$f(x)$ $g(x)$ $h(x)$ NONE OF THESE

c. [2 points] Which function(s) is(are) definitely invertible?

$f(x)$ $g(x)$ $h(x)$ NONE OF THESE

d. [2 points] How many times could the graph of $f(x)$ intersect the graph of $h(x)$?

0 1 2 3 4 more than 4

e. [2 points] Suppose the graph of h is concave up. Which of the following is(are) definitely true?

$w > 0$ $w < 0$ $r > 0$ $r < 0$ NONE OF THESE