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

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

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