4. [6 points] A rational function $h(x)$ has zeros at $x = -1, 0, 2$, vertical asymptotes at $x = 1, 3$, and a horizontal asymptote at $y = -2$. Find a possible formula for $h(x)$. You do not need to show your work, but you may receive credit for correct work shown. There are many correct answers, and you can leave your answer unsimplified.

$h(x) =$ $\frac{-2x(x+1)(x-2)}{(x-1)(x-3)^2}$

Solution: There are lots of possible right answers. The important components are that x, $(x+1)$, $(x-2)$ appears as factors in the numerator (and not in the denominator), that $(x-1)$ and $(x-3)$ appear as factors in the denominator (and not in the numerator, or if they appear in the numerator they appear with a higher power in the denominator), that the numerator and denominator have the same degree and that the ratio of the leading coefficients is -2.

5. [5 points] The graph of the function $r(x) = \frac{x-1}{2x}$ is a transformation of the graph of the function $m(x) = \frac{1}{x}$. Fill in the following blanks with the transformations needed to transform the graph of $m(x)$ into the graph of $r(x)$. On each line use one of the phrases given below for the first blank and a number for the second blank, if applicable (for reflections, do not use the second blank). Be sure to list the transformations in the proper order. You may not need to use all four lines below, so just leave any unused lines blank.

Shift it horizontally to the right	Shift it horizontally to the left	Shift it vertically upwards	Shift it vertically downwards	Reflect it over the y-axis
Compress it horizontally	Stretch it horizontally	Compress it vertically	Stretch it vertically	Reflect it over the x-axis

To get the graph of $r(x)$ starting with the graph of $m(x)$,

first, we compress it horizontally by 1/2,

and then we reflect it over the x-axis by _____,

and then we shift it vertically upwards by 1/2,

Solution: Note that there are many possible correct answers. The key is writing the function as $r(x) = \frac{1}{2} - \frac{1}{2x}$.