

2. [7 points]

- a.** [3 points] Let $f(x) = \ln(x)$ and let g be the function whose graph is obtained by performing the following transformations to the graph of f , in the following order:

- 1) A horizontal stretch by a factor of 3.
- 2) A horizontal shift to the left by 1.
- 3) A vertical compression by factor of $\frac{1}{5}$.

Write down a formula for $g(x) =$ _____

- b.** [4 points] The graph $y = K(x)$ has the line $y = 2$ as its horizontal asymptote and a horizontal intercept at $(1, 0)$. Let H be the function given by the formula $H(x) = -\frac{1}{7}K(2x+3)$. Find the horizontal intercept and the equation of the horizontal asymptote of the graph $y = H(x)$.

Horizontal asymptote: _____

Horizontal intercept: _____

3. [6 points]

- a.** [4 points] Let a be a non-zero number. Find all the zeroes of the polynomial given by the formula $p(x) = 3x(x^2 + ax)^2$. Your answers may depend on a .

Answer: _____

- b.** [2 points] Let f and g be functions given by the formulas

$$f(x) = \sqrt{1 + 7\sqrt{x}} \quad \text{and} \quad h(x) = \sqrt{x}.$$

If g is a function such that $f(x) = g(h(x))$, find a formula for $g(x)$.

$g(x) =$ _____