Math 162
Quiz 2

Justify all answers with neat and organized work. Clearly indicate your answers. Round answers to four decimal places.
20 points possible

1. (3 pts.) Consider $R(w) = 39.4(1.998)^w$; $\quad w = 5.35$
(a) Is $w = 5.35$ an input or an output value?

(b) Find the output or input that corresponds to $w = 5.35$.

2. (3 pts.) Consider $R(w) = 39.4(1.998)^w$; $\quad R(w) = 394$
(a) Is $R(w) = 394$ an input or an output value?

(b) Find the output or input that corresponds to $R(w) = 394$.

3. (3 pts.) Consider $Q(x) = 0.32x^3 - 7.9x^2 + 100x - 15$; $\quad Q(x) = 714.68$
(a) Is $Q(x) = 714.68$ an input or an output value?

(b) Find the output or input that corresponds to $Q(x) = 714.68$.

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4. (2 pts.) (Based on data from Ryan and Gross, "The Diffusion of Hybrid Seed Corn in Two Iowa Communities," *Rural Sociology*, March 1943.) The percentages of Iowa corn farmers in two communities who had heard about and had planted hybrid seed corn t years after 1924 can be modeled as

$$\text{percentage hearing} = h(t) = \frac{100}{1 + 128.04e^{-0.72t}} \text{ percent, and}$$
$$\text{percentage planting} = p(t) = \frac{100}{1 + 913.72e^{-0.61t}} \text{ percent.}$$

Write a model for the percentage of Iowa farmers hearing about but not yet planting hybrid seed corn t years after 1924.

5. Rewrite each pair of functions as one composite function (using the order naturally suggested by the choice of letters for the variables).

(a) (3 pts.) $f(t) = 3e^t \qquad t(p) = 4p^2$

(b) (3 pts.) $g(x) = \sqrt{7x^2 + 5x - 2} \qquad x(w) = 4e^w$

(c) (3 pts.) $C(p) = \sqrt{p} \qquad p(t) = 1000(0.4t^2 + 2.5)$

Bonus. (2 bonus points possible) In what year was George Washington first elected president of the United States of America?