

8. [13 points] Roger the rabbit is a large rabbit that likes to eat! On a normal day, Roger has a daily meal of 12 ounces of carrots and 7 ounces of lettuce mixed together. However, sometimes Roger will want to eat a different mix for his daily meal. Let $R(z)$ be the ratio of the amount of lettuce in his food mix to the total amount of food if $|z|$ ounces of lettuce have been added ($z > 0$) or removed ($z < 0$). Note that Roger starts with 12 ounces of carrots and 7 ounces of lettuce and that the amount of carrots does NOT change.

- a. [3 points] Evaluate $R(0)$, $R(4)$ and $R(-0.5)$.

$$R(0) = \underline{\hspace{2cm}} \quad R(4) = \underline{\hspace{2cm}} \quad R(-0.5) = \underline{\hspace{2cm}}$$

- b. [4 points] Find the domain and range of $R(z)$ in the context of this problem.
Use either inequalities or interval notation to express your answers.

$$\text{Domain: } \underline{\hspace{2cm}} \quad \text{Range: } \underline{\hspace{2cm}}$$

- c. [2 points] Find a formula for $R(z)$ in terms of z .

$$\text{Answer: } R(z) = \underline{\hspace{2cm}}$$

- d. [4 points] If Roger wants a food mixture with 65% lettuce, how much lettuce must he add or remove to create this mixture? *Show your work carefully, round to the nearest 0.1 ounce, include units, and clearly indicate whether lettuce should be added or removed.*

$$\text{Answer: } \underline{\hspace{2cm}}$$