

3. [12 points] A gardener is growing a plant.
- Let t be the number of days after the plant first sprouts.
 - The height of the plant t days after it sprouts is $H(t)$ inches.
 - The gardener gives the plant $W(t)$ cups of water on the t^{th} day after it sprouts.
 - When the gardener uses M cups of water, she mixes in $V(M)$ teaspoons of special plant vitamins.

Suppose that $V(M)$ and $H(t)$ have inverses.

For each of the following, give a practical interpretation of the expression in the context of the problem, or explain why the expression does not make sense in this context.

a. [3 points] $H(6) = 3$

Solution: The height of the plant 6 days after it sprouts is 3 inches.

b. [3 points] $V(W(4))$

Solution: $V(W(4))$ is the number of teaspoons of special plant vitamins the gardener mixed in on the fourth day after the plant sprouted.

c. [3 points] $W(H(6))$

Solution: This expression does not make sense: the units of $H(6)$ are inches, while the input of W should be days.

d. [3 points] $\frac{H^{-1}(12) - H^{-1}(9)}{12 - 9} = 2$

Solution: Between when the plant was 9 inches and 12 inches tall, it took the plant an average of 2 days to grow 1 inch taller.