Warm Up: Combinations of Functions

A pebble is thrown into a lake and the radius of the circular ripple increases at a constant rate of 0.7 meters/second. Your goal is to determine the area (in square meters) inside the ripple in terms of the number of seconds elapsed since the pebble hit the water. Before determining a function to represent this relationship, answer the following questions.

a) **Draw a picture of the situation and label the quantities. Imagine how the quantities are changing together. What processes need to be carried out to determine the area inside the ripple when the number of seconds since the pebble hit the water is known.**

b) **Complete the following statements**

i) **As the time since the pebble hit the water increases, the radius of the circular ripple _____ at a constant rate of _____.**

ii) **As the radius of the circular ripple increases, the area of the circle _____.**

iii) **As the time since the pebble hit the water increases, the area of the circle _____.**

c) **Define variables to represent the values that the relevant quantities take on.**

d) Define the following functions:

i) *f* that defines the radius (in meters) of the circular ripple *r* as a function of the time elapsed (in seconds) *t* since the pebble hit the water.

ii) *g* that defines the area of the circular ripple A (in square meters) as a function of the radius (in meters) of the circular ripple *r*

iii) *h* that defines the area of a circular ripple A (in square meters) as a function of time elapsed *t* (in seconds)

e) Compute the value of h(4). Interpret the meaning of h(4).