Honors Pre-calculus

HW Combinations of Functions PRACTICE

1)

Use the tables below to answer the following questions

x	$f(x)$
–4	16
–3	13
–2	6
–1	0
0	–4
1	–7
2	–9
3	–10

x	$g(x)$
–8	–20
–6	–17
–4	–10
–2	–4
0	–1
2	2
4	6
6	11

a. Evaluate the following expressions:
   i. $g(f(-2))$ ii. $f(g(0))$ iii. $g(g(4))$ iv. $f(g(2))$
   v. $g(f(-1))$ vi. $f(f(0))$
b. Solve the equation $g(f(x)) = -10$ for x.
c. Solve the equation $f(g(x)) = 16$ for x.

2)

A ball is thrown into a lake, creating a circular ripple whose radius travels outward at a speed of 7 cm per second. The goal of this problem is to express the area of the circle as a function of the number of seconds that have elapsed since the ball hit the lake.

a. Identify the quantities in the situation whose values vary and state what units you'll use to measure each of these quantities.
b. Identify the quantities in the situation whose values are fixed and state what units you will use to measure each of these quantities.
c. Draw a diagram of the situation and label the relevant quantities in the situation.
d. As the amount of time t in seconds since the ball hit the lake increases over each of the given time periods, how does the radius r of the ripple (in centimeters) change?
   i. from $t = 0$ to 3 seconds
   ii. from $t = 4$ to 6 seconds
   iii. from $t = 6$ to 6.5 seconds
e. Define a function g that defines the radius r of the ripple in terms of the time t in seconds since the ball hit the water.
f. Define a functions f that determines the area of the ripple A in terms of the time t in seconds since the ball hit the water.
g. Simplify your set of functions defined in part (d) in order to define a function h that expresses the area of the circle as a function of the time since the ball struck the water. Define all variables, including their units of measurement.
h. Suppose $h(t)$ represents the area of the circle (measured in square centimeters) when t seconds have passed since the ball hit the water. Describe the meaning of $h(2.3)$ without performing any calculations. Then calculate and interpret the meaning of the value of this expression.