**Notes:**

1. An oil spill is spreading in a roughly circular shape. The radius, *r*, is growing by 10 feet per hour.
2. Construct a function *r(t)* that represents the radius *r* as a function of time *t* (in hours since the oil spill).
3. The area *A* of the spill is a function of the radius *r* (in feet), given by . If the oil spill has been spreading for 2 hours, what is the area of the spill?
4. How could you compose the functions *A* and *r* to give the area in terms of time *t*?

**Vocabulary**

The Composition of Two Functions:

1. Given and , find:

|  |  |
| --- | --- |
| * 1. f(2)
 | * 1. g(2)
 |
| * 1. g(f(2))
 | * 1. f(g(2))
 |
| * 1.
 | * 1.
 |

1. Use the accompanying table to find the answers to a – c.

|  |  |  |
| --- | --- | --- |
|  |  |  |
| 0 | 8 | 1 |
| 1 | 3 | 0 |
| 2 | -2 | 3 |
| 3 | -7 | 2 |

1. 
2. 
3. 
4. Using the accompanying graphs to find the answers to **a – c.**

|  |  |  |
| --- | --- | --- |
| **Graph of f(x)** |  | **Graph of g(x)** |
|  |  |  |

1. 
2. 
3. 
4. From the table, determine the values of the following compositions.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | 0 | 1 | 2 | 3 | 4 | 5 |
|  | 3 | -1 | 1 | 3 | 5 | 7 |
|  | 5 | 3 | 2 | 1 | 0 | -1 |
|  | 2 | 2 | 3 | 4 | 5 | 6 |

1. 

b. 

1. Given  and  find:

|  |  |
| --- | --- |
| 1.
 | 1.
 |

1. Let and .

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *t* | *g(t)* |  | *t* | *h(t)* |
| 0 |  |  | 1 |  |
| 1 |  |  | 3 |  |
| 2 |  |  | 5 |  |

1. Complete the following tables.
2. Find and .
3. Find and simplify .
4. Find and simplify .
5. What do you notice about the functions and ?
6. Graph both *g(t)* and *h(t)* on your calculator. What do you notice?