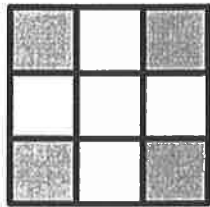


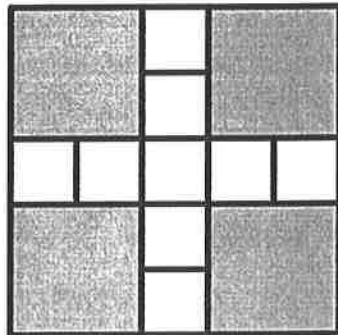
Module 1 Practice Test

(Mod 1.1 - Mod 1.11)

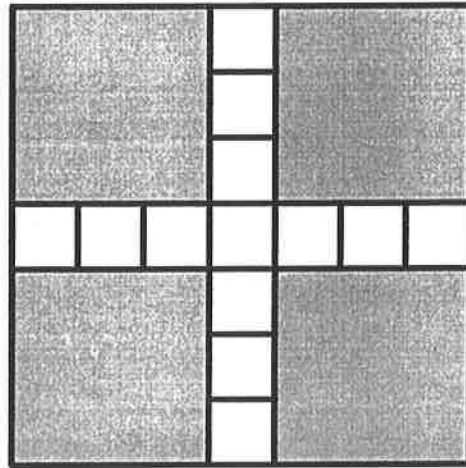
Below is a sample of several different floor designs available to customers. Use these designs to answer questions 1 – 3.



Design 1



Design 2



Design 3



1. How many white tiles would be found in Design 50?

$$d = 4 \quad f(n) = f(n-1) + 4$$

n	1	2	3	4	5	6	...	50
$f(n)$	5	9	13	17	21	25	...	$5 + 4(50-1) = 201$

2. Write an expression that would help you calculate the number of tiles in Design n .

$$f(n) = f(1) + d(n-1)$$

$$f(n) = 5 + 4(n-1)$$

$$f(n) = 5 + 4n - 4$$

$$f(n) = 4n + 1$$

3. The white tiles represent a beautiful and expensive marble tile. You cannot afford to buy any more than 100 tiles. Which is the largest design you can afford?

$$4(24) + 1 = 97 \text{ marble tiles}$$

Match each item on the left with a *different representation* from the *same sequence* on the right.

d 4. $3, 5, 7, 9, 11, \dots$

a. $f(1) = 3$
 $f(x) = f(x - 1) - 2$

a 5.

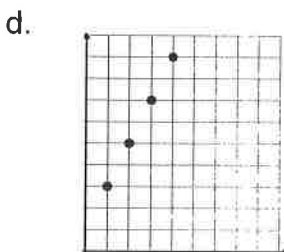
x	$f(x)$
1	3
2	1
3	-1
4	-3
5	-5

b. $3, \frac{3}{2}, \frac{3}{4}, \frac{3}{8}, \frac{3}{16}, \dots$

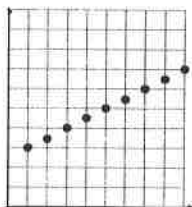
c 6. $f(1) = 6$
 $f(x) = f(x - 1) \times 2$

c. $f(x) = 3 \cdot 2^x$

b 7. $f(x) = 6 \cdot \left(\frac{1}{2}\right)^x$



e 8.



e.

x	$f(x)$
1	3
2	3.5
3	4
4	4.5
5	5
\vdots	\vdots
\vdots	\vdots

b

13. Which sequence best matches the explicit function $f(x) = 3 \cdot (-2)^x$

a. 6, -12, 24, -48, 96

b. -6, 12, -24, 48, -96

c. -2, -6, -18, -54, -162

d. $-\frac{3}{2}$, -2, -18, -54

x	1	2	3	...
f(x)	$3(-2)^1 = -6$	$3(-2)^2 = 12$	$3(-2)^3 = -24$...

Short Answer

14. Make a table for the first five terms of the sequence represented by the equation $f(x) = 3x - 4$.

x	f(x)
1	$3(1) - 4 = -1$
2	$3(2) - 4 = 2$
3	$3(3) - 4 = 5$
4	$3(4) - 4 = 8$
5	$3(5) - 4 = 11$

15. Write the explicit equation for the sequence 1, 2, 4, 8, 16, ...

1, 2, 4, 8, 16, ... $r=2$
 $+1 + 2 + 4 + 8$
 no common difference

~~Recursive $f(n) = f(n-1) \cdot 2$~~

$f(1) = 1$

$r = 2$

$f(n) = f(1) \cdot r^{n-1}$

$f(n) = 1 \cdot (2)^{n-1}$

or
 $f(n) = 2^{n-1}$

Short Essay

$$f(x) = 3(x - 1) + 5$$

16. Write a short essay that compares and contrasts recursive functions and explicit functions. Then, say whether the function above is recursive or explicit by using the first part of your essay to support your answer.

Key ideas to consider

- Recursive functions always require the previous term (use $f(n-1)$ notation), you need to know either the common difference or common ratio, and you wouldn't use it to find the n th term when the value of n is large compared to the known sequence values.
- Explicit functions always require knowledge of the value of the first listed term, you need to know either the common difference or common ratio, and you can use it to find any n th term efficiently.
- Although $f(x) = 3(x-1) + 5$ does contain a $(x-1)$ component, it is not $f(n-1)$ so this is an explicit function.

