

## Warm Up

1) How many ways can the letters of "BEGINNING" be rearranged?

15,120

2) On a spinner  $\frac{1}{2}$  spaces you win \$5,  $\frac{3}{8}$  you win \$20,  $\frac{1}{8}$  you win \$100. What is the expected value of playing? Is it worth playing if it costs \$15 to play?

\$22.50

Yes

## Warm Up

3)  $a = 24$ ,  $A = 78^\circ$  and  $B = 62^\circ$ . Find side  $b$ .

21.7

4) The longest day in Deerfield is 18.5 hours and the shortest is 5.5 hours. Write an equation that models the daylight hours beginning in the spring?

$$d(t) = 6.5\sin(2\pi x) + 12$$

5)  $y = |x - 5| + 3$ , shift it up 8 and left 4.

$$y = |x - 1| + 11$$

# Unit 7: Sequence and Series

# **Unit 7: Sequence and Series**

**Sequence -**

**An ordered list of numbers**

**Series -**

**The sum of a sequence**

# Unit 7: Sequence and Series

**Recursive Equation** - an equation that can only go from one term to the next, unique to each sequence and would be given in a question

**Explicit Equation** - able to skip to any term in the sequence (given formulas)

## WB 701 Recursive Sequences

$a_{n-1}$  = previous term (this is a single variable to replace)

~~n~~ = the term you're looking for

**n** =

Ex 1)  $a_n = 3 + a_{n-1}$   
 $a_1 = 5$

| n | $a_n$ |  |
|---|-------|--|
| 1 | 5     |  |
| 2 |       |  |
| 3 |       |  |
| 4 |       |  |
| 5 |       |  |

Ex 2)  $b_n = 4 b_{n-1}$   
 $b_1 = \frac{1}{2}$

| n | $b_n$         |  |
|---|---------------|--|
| 1 | $\frac{1}{2}$ |  |
| 2 |               |  |
| 3 |               |  |
| 4 |               |  |
| 5 |               |  |

Ex 3)  $a_n = 2n + a_{n-1}$   
 $a_1 = 1$

| n | $a_n$ |  |
|---|-------|--|
| 1 | 1     |  |
| 2 |       |  |
| 3 |       |  |
| 4 |       |  |
| 5 |       |  |

## WB 702 Explicit v. Recursive Equations

### PRACTICE

For each explicit formula, find the indicated term.

1)  $a_n = 4 - 2n; a_{10}$

2)  $b_n = -2n^2 - 4n; b_3$

3)  $c_n = 16\left(-\frac{1}{2}\right)^n; c_3$

4)  $d_n = 3n^2 - 12; d_5$

5)  $e_n = -3(5)^{n-2} + 4; e_4$

6)  $f_n = \frac{2n-7}{n-1}; f_6$

## CREATING AN EXPLICIT FORM FROM A RECURSIVE FORM

- If the recursive form is **adding (or subtracting)** a constant number to the previous term, the explicit form will be **linear** Example:  $a_{n-1} + 3$  or  $a_{n-1} - 7$  [ARITHMETIC SEQUENCE]
- If the recursive form is **multiplying (or dividing)** a constant ratio to the previous term, the explicit form will be **exponential**. Example:  $3a_{n-1}$  or  $(1/2)a_{n-1}$  [GEOMETRIC SEQUENCE]
- If the recursive form has you plug in  **$n$  separately** from the previous term, the explicit form should be **quadratic** Example:  $a_{n-1} + 2n$  or  $a_{n-1} + 3n - 4$

**PRACTICE** (Test questions won't have the table laid out for you though)

For each recursive formula, determine the type of explicit formula (linear, exponential or quadratic). Then find the explicit equation (Stat -> Regression)

1)  $a_n = a_{n-1} - 5; a_1 = 4$

| n | $a_n$ |
|---|-------|
| 1 |       |
| 2 |       |
| 3 |       |
| 4 |       |
| 5 |       |

2)  $a_n = 1.5 + a_{n-1}; a_1 = -0.5$

| n | $a_n$ |
|---|-------|
| 1 |       |
| 2 |       |
| 3 |       |
| 4 |       |
| 5 |       |

3)  $a_n = \frac{1}{3}a_{n-1}; a_1 = 36$

| n | $a_n$ |
|---|-------|
| 1 |       |
| 2 |       |
| 3 |       |
| 4 |       |
| 5 |       |



**Assignment::  
Finish Questions  
on WB 701 and the  
1st WB 702**

**TASK due Friday**

**You have until the end of the  
period to finish and turn in the  
Unit 6 E.C. page**