Spiral Review

Simplify the factorial expression.

1.
$$\frac{2!}{4!} = \frac{3!}{4!3!2!}$$

$$= \frac{1}{12}$$

2.
$$\frac{5!}{7!} = \frac{5!488!}{7.65!488!}$$

$$= \frac{1}{42}$$

$$4 \cdot \frac{10!}{(5! - 3!)} = 5040$$

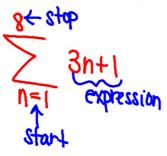
p.570 8.1 Sequences and Series

Sequence: Use subscript to determine which term you are finding.

Example:
$$Q_1, Q_2, Q_3, \dots$$

Summation Notation: Used when finding the sum of a certain number of terms in a sequence.

Example:



Students will be able to write the first five terms of the sequence.

Example 1: Write the first five terms of the sequence. (Assume n begins with 1)

a.)
$$a_n = 4n - 7$$

$$a_1 = 4(1) - 7 = -3$$

$$a_2 = 4(3) - 7 = 1$$

$$a_3 = 4(3) - 7 = 5$$

$$a_4 = 9$$

$$a_5 = 13$$

b.)
$$a_n = \frac{2n}{n+1}$$
 $A_1 = \begin{bmatrix} 1 \end{bmatrix}$
 $A_2 = \begin{bmatrix} 1.3333 = 4 \\ 3 \end{bmatrix}$
 $A_3 = \begin{bmatrix} 3 \\ 2 \end{bmatrix}$
 $A_4 = \begin{bmatrix} 1.6 = 8 \\ 5 \end{bmatrix}$
 $A_5 = \begin{bmatrix} 1.6667 = 5 \\ 3 \end{bmatrix}$

Students will be able to use the graphing calculator to find the first five terms of a sequence.

Example 2: Write the first five term of the sequence using the table feature on the graphing calculator (number 3 decimal places)

a.)
$$a_n = \frac{(1+(-1)^n)}{(3n)}$$
 $a_1 = 0$
 $a_2 = .323$
 $a_3 = 0$

c.)
$$a_n = \frac{1}{\sqrt{n}}$$

$$a_1 = 1$$

$$a_2 = .707$$

$$a_3 = .577$$

$$a_4 = .5$$

$$a_5 = .447$$

b.)
$$a_n = \frac{3^n}{4^n}$$

 $a_1 = .75$
 $a_2 = .508$
 $a_3 = .421$

d.)
$$a_n = (3n-1)(n+2)$$

 $a_1 = b$ $a_4 = bb$
 $a_2 = 30$ $a_5 = 98$
 $a_3 = 40$

Students will be able to write the first five terms of the sequence given the first term.

Example 3: Write the first five terms of the sequence defined recursively.

$$a_{1} = 15$$
 $a_{k} = a_{k-1} + 3$
 $a_{1} = 15$
 $a_{k} = 15 + 3 = 18$
 $a_{2} = 15 + 3 = 18$
 $a_{3} = 18 + 3 = 18$
 $a_{4} = 18 + 3 = 18$
 $a_{5} = 18 + 3 = 18$

b.)
$$a_0 = -1$$

 $a_1 = 5$
 $a_k = a_{k-2} + a_{k-1}$
 $0_0 = -1$
 $0_1 = 5$
 $0_2 = -1 + 5 = 4$
 $0_3 = 5 + 4 = 9$
 $0_4 = 4 + 9 = 13$

Students will be able to find the sum of a sequence.

Example 4: Find the sum.

a.)
$$\sum_{i=1}^{6} (3i-1)$$

= $2+5+8+11+14+17$
= 57

$$= 10^{5} \text{ m}^{2}$$

$$c.) \sum_{j=3}^{5} \frac{1}{j+1}$$

$$= \underbrace{37}_{b0}$$

d.)
$$\sum_{k=1}^{5} 4$$

Turn-in: p.577 (14, 26, 56, 96)

HW:

p.577 (7-25, 53-57, 87-97 odds)

** (17-25 part (a) only)