

**Day 3 – Comparing Arithmetic & Geometric Sequences**

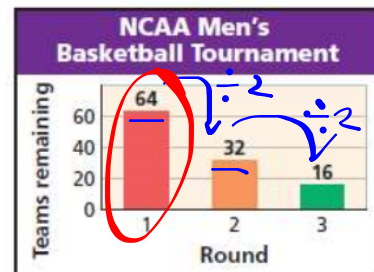
Now it's time to apply arithmetic and geometric sequences to real world contexts.

Arithmetic	Geometric
Add or Subtract by the same number (common difference)	Multiply by the same number (constant ratio)
Explicit: $a_n = a_1 + (n - 1)d$	Explicit: $a_n = a_1 \cdot r^{n-1}$
Recursive: $a_n = a_{n-1} + d$	Recursive: $a_n = r(a_{n-1})$

For each of the following problems, determine if it is arithmetic or geometric, create an explicit rule, and then answer the question:

1. In the NCAA men's basketball tournament, 64 teams compete in round 1. Fewer teams remain in each following round, as shown in the graph. How many teams compete in Round 6?

Type: geo  
 Explicit Formula:  $a_n = 64(\frac{1}{2})^{n-1}$   
 Solution: 2 team  
 $a_n = a_1 \cdot r^{n-1}$   
 $a_1 = 64$   
 $r = \frac{1}{2}$   
 $n = 6$



2. The odometer on a car reads 60,473 on Day 1. Every day, the car is driven 54 miles. If this pattern continues, what is the odometer reading on Day 20?

Type: a.  
 $a_n = a_1 + d(n-1)$   
 $a_{20} = 60473 + 54(20-1)$   
 $a_{20} = 61499$  mi  
 $d = +54$   
 $n = 20$

Algebra 1

Unit 11: Comparing Linear, Quadratic, & Exponential Functions

Notes

Explicit Formula: \_\_\_\_\_

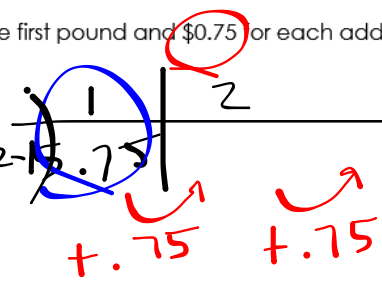
Solution: \_\_\_\_\_

3. To package and ship an item, it costs \$5.75 for the first pound and \$0.75 for each additional pound. What is the cost of shipping a 12 pound package?

Type: a

Explicit Formula:  $a_{12} = 5.75 + .75(12-1)$

Solution:  $a_{12} = \$14$



$d = +.75$   
 $a_1 = 5.75$   
 $n = 12$

4. The table shows a car's value for 3 years after it is purchased. How much will the car be worth in the 10<sup>th</sup> year?

Type: g

Explicit Formula:  $a_{10} = 10000(.8)^{10-1}$

Solution:  $a_{10} = 1342.18$

$\frac{8000}{10000} =$   
 $r = .8$

Year	Value (\$)
1	10,000
2	8,000
3	6,400

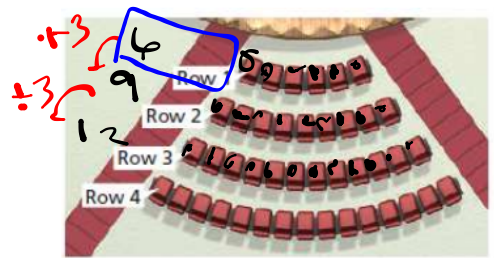
$n = 10$

5. Seats in a concert hall are arranged in the pattern shown. How many seats are in the 15<sup>th</sup> row?

Type: a

Explicit Formula:  $a_{15} = 6 + 3(15-1)$

Solution:  $a_{15} = 118$  seats



b. A ticket costs \$40. Suppose every seat in the first 10 rows is filled. What is the total revenue from those seats?

