



Name _____

Period _____

Date _____

READY

$$3(n-1)+2$$

$$3n-3+2$$

$$f(n)=3n-1$$

Topic: Arithmetic and geometric sequences

For each set of sequences, find the first five terms. Then compare the growth of the arithmetic sequence and the geometric sequence. Which grows faster? When?

1. Arithmetic sequence: $f(1) = 2$, common difference, $d = 3$

$f(0) = -1$ Geometric sequence: $g(1) = 2$, common ratio, $r = 3$

Arithmetic	Geometric
$f(1) = 2$	$g(1) = 2$
$f(2) = 5$	$g(2) = 6$
$f(3) = 8$	$g(3) = 18$
$f(4) = 11$	$g(4) = 54$
$f(5) = 14$	$g(5) = 162$

$$g(n) = 2 \cdot 3^{n-1}$$

$$f(n) = 3(n-1) + 2$$

a) Which value do you think will be more, $f(100)$ or $g(100)$?

b) Why? multiplying instead of adding growing faster!

2. Arithmetic sequence: $f(1) = 2$, common difference, $d = 10$

Geometric sequence: $g(1) = 128$, common ratio, $r = \frac{1}{2}$

Arithmetic	Exp.	Geometric
$f(1) = 2$	2	$g(1) = 128$
$f(2) = 12$	$2+10$	$g(2) = 64$
$f(3) = 22$	$2+10+10$	$g(3) = 32$
$f(4) = 32$	$2+10+10+10$	$g(4) = 16$
$f(5) = 42$		$g(5) = 8$

$$g(n) = 128 \cdot \left(\frac{1}{2}\right)^{n-1}$$

$$f(n) = 10(n-1) + 2$$

a) Which value do you think will be more, $f(100)$ or $g(100)$?

b) Why? adding instead of dividing

3. Arithmetic sequence: $f(1) = 20$, $d = 10$

Geometric sequence: $g(1) = 2$, $r = 2$

Arithmetic	Geometric
$f(1) = 20$	$g(1) = 2$
$f(2) = 30$	$g(2) = 4$
$f(3) = 40$	$g(3) = 8$
$f(4) = 50$	$g(4) = 16$
$f(5) = 60$	$g(5) = 32$

$$* f(n) = 10(n-1) + 20$$

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

a) Which value do you think will be more, $f(100)$ or $g(100)$?

b) Why? Any multiplying pattern grows faster