

Lesson 9.3 Warm Up (Clickers)

1. Simplify: $\frac{2x - 8}{x - 2} + \frac{3}{x - 4}$

2. Identify any holes and asymptotes:

$$\frac{x^2 - 16}{x^2 + x - 20}$$

Ex. Is the sequence geometric? If it is, what are a_1 and r ?

a. 3, 6, 12, 24, 48, ...

b. 3, 6, 9, 12, 15, ...

Lesson 9.3 Geometric Sequences

Essential Understanding: In a geometric sequence, the ratio of any term to its preceding term is a constant value.

Key Concept Geometric Sequence

A **geometric sequence** with a starting value a and a **common ratio** r is a sequence of the form

$$a, ar, ar^2, ar^3, \dots$$

A recursive definition for the sequence has two parts:

$$\begin{aligned} a_1 &= a && \text{initial condition} \\ a_n &= a_{n-1} \cdot r, \text{ for } n > 1 && \text{recursive formula} \end{aligned}$$

An explicit definition for this sequence is a single formula:

$$a_n = a_1 \cdot r^{n-1}, \text{ for } n \geq 1$$

1 Is the sequence geometric?

2, 4, 8, 16, ...

Yes

No

2 Is the sequence geometric?

1,5,9,13,17,...

Yes

No

Ex. What are the indicated terms of the geometric sequence?

a. the 10th term of the geometric sequence

4, 12, 36, ...

b. the second and third terms of the geometric sequence 2, _____, _____, -54, ...

3 What is the second term of the geometric sequence

3, _____, 12?

4 What are the 2nd and 3rd terms of the geometric

sequence 2, _____, _____, 128, ...?

Ex. When a ball bounces, the heights of consecutive bounces form a geometric sequence. What are the heights of the 4th and 5th bounces?

