

WARM UP

Find the next term in each sequence using the pattern shown.

(A) $1, 3, 5, \underline{7}$

(A) $23, 19, 15, 11, \underline{7}$

(G) $2, 10, 50, \underline{250}$

(G) $7, -14, 28, -56, \underline{112}$

Take out your HW!

Learning Target

I can... identify and write a geometric sequence.

<p>Geometric Sequence:</p>	<p>A sequence of numbers where each term is multiplied by the same amount.</p>
<p>Common Ratio: $r = \frac{a_2}{a_1}$</p>	<p>The # each term is being multiplied by. $r = \frac{a_2}{a_1}$</p>
<p>Identifying a Geometric Sequence</p>	<p>Determine whether the sequences are geometric sequences. If yes, determine the common ratio.</p> <p>1) $2, 10, 50, 250 \dots$ yes $r=5$</p> <p>2) $135, 45, 15, 5 \dots$ yes $r = \frac{45}{135} = \frac{1}{3}$</p> <p>3) $6, 18, 24, 30 \dots$ NO</p> <p>4) $7, -14, 28, -56 \dots$ yes $r=-2$</p> <p>5) $80, -40, 20, -10 \dots$ yes $r = -\frac{1}{2}$</p> <p>6) $-9, -36, -144, -576 \dots$ yes $r = 4$</p>
<p>Continuing Geometric Sequences</p>	<p>Given the geometric sequence, find the next three terms.</p> <p>7) $7, -21, 63, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}$</p> <p>8) $3072, 768, 192, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}$</p> <p>9) $8, 4, 2, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}$</p>
<p>Geometric Sequence EXPLICIT Formula</p>	<p>The n^{th} of a geometric sequence can be found using the formula:</p> <p>$a_n = a_1 (r)^{n-1}$</p> <p>$n =$ term # you want.</p> <p>↑ First term ↑ Common Ratio</p>
<p>Examples... Write the rule for the n^{th} term, then find a_7.</p>	<p>10) $3, 9, 27 \dots$ $a_1 = 3$ $r = 3$ $a_n = 3(3)^{n-1}$ $a_7 = 2187$</p> <p>11) $-4, 20, -100 \dots$ $a_1 = -4$ $r = -5$ $a_n = -4(-5)^{n-1}$ $a_7 = -4(-5)^{7-1} = -62500$</p>

It's time to practice!!

Determine whether each sequence is a geometric sequence.

If yes, identify the common ratio.

1. 4, 12, 36, 108, ...

2. 5, 10, 15, 20, ...

3. 120, -60, 30, -15, ...

4. 1, -4, 16, -64, ...

5. 50, 35, 20, ...

6. 625, 125, 25, 5, ...

Find the next three terms of each geometric sequence.

7. 4, 8, 16, _____, _____, _____

8. 1, -6, 36, _____, _____, _____

9. 486, 162, 54, _____, _____, _____

10. 3, 15, 75, _____, _____, _____

11. 240, -120, 60, _____, _____, _____

12. -5, -20, -80, _____, _____, _____

Write an equation to find the n th term of each sequence. Then find a_9

13. 5, 20, 80, ...

14. -2, 10, -50, ...

15. -65536, 16384, -4096, ...

16. 6, -18, 54, ...

17. 1536, 768, 384, ...

18. -1, -7, -49, ...

Answers Scrambled:

327,680	Yes, $r=3$	6	Yes, $r = -\frac{1}{2}$	-30, 15, -7.5	no
18, 6, 2	-320, -1280, -5120	Yes, $r = 1/5$	375, 1875, 9375	Yes, $r = -4$	-781,250
-5,764,801	no	39,366	32, 64, 128	-1	-216, 1296, -7776