Arithmetic and Geometric Sequences HW

Directions: For the sequences below, find the next three terms in the sequence. Then, determine if they are arithmetic.

1. For each list of numbers, determine the next three numbers in the list.

    a.   1, 2, 3, 4, ____,____,____   _____

    f.   2, 3.5, 5, 6.5, 8, 9.5,____,____,____   _____

    b.   7, 9, 11, 13, 15, ____,____,____   _____

    g.   17.5, 13.2, 8.9, 4.6, 0.3, ____,____,____   _____

    c.   10, 7, 4, 1, -2, ____,____,____   _____

    h.   2, 5, 11, 23, 47, ____,____,____   _____

    d.   2, 4, 7, 11, 16, ____,____,____   _____

    j. 1, 1, 2, 3, 5, 8, ____,____,____   _____

    e.   0, 1, 4, 9, 16, 25, ____,____,____   _____

Directions: Find the first 5 terms of each sequence.

2. a. $a_1 = 2$
    $a_n = a_{n-1} + 4$

    b. $a_1 = -5$
    $a_n = a_{n-1} - 5$

Directions: Complete the table by writing the Common Difference and Closed/Explicit Form for each sequence then find the 35th term of each sequence.

Sequence	Common Difference	Closed/Explicit Form	35th term (a_{35} =)
3. 4, 6, 8, 10, 12…			$a_{35} =$
4. 87, 78, 69, 60…			$a_{35} =$
5. 5, 3, 1, -1, -3…			$a_{35} =$

Determine if the sequence is geometric. If it is, find the common ratio.

6. $-1, 6, -36, 216, \dots$ 7. $4, 16, 36, 64, \dots$

Given the explicit formula for a geometric sequence find the first five terms of the sequence.

8. $a_n = 3^{n-1}$ 9. $a_n = -4(3)^{n-1}$

Find the next three terms in each geometric sequence.

10. 2, 4, 8, 16, … _____, _____, _____

11. 400, 200, 100, 50, … _____, _____, _____

12. 4, -12, 36, -108, … _____, _____, _____

Find the missing term(s) in each geometric sequence.

13. _____, _____, 1, -3, 9, …

14. _____, 6, 18, _____, ….

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15. The first term of a geometric sequence is 1, and the common ratio is 10. What is the 10th term of the sequence?

16. What is the 11th term of the geometric sequence 3, 6, 12, 24, …?

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17. 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, until all but one team have been eliminated. How many teams compete in round 5?

NCAA Men's Basketball Tournament

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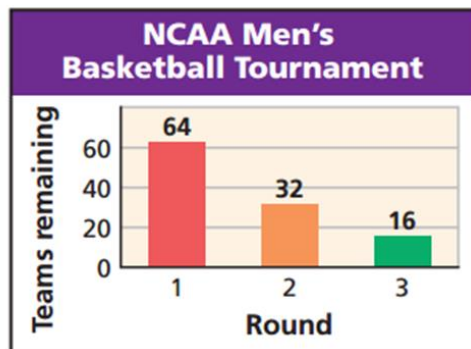
18. The 10th term of a geometric sequence is 0.78125. The common ratio is -0.5. Find the first term of the sequence.

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19. A bungee jumper jumps from a bridge. The diagram shows the bungee jumper's height above the ground at the top of each bounce. The heights form a geometric sequence. What is the bungee jumper's height at the top of the 5th bounce?

First bounce 200 ft
Second bounce 80 ft
Third bounce 32 ft

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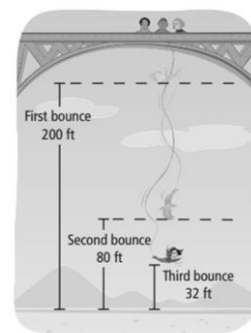
20. The number of points that a player must accumulate to reach the next level of a video game form a geometric sequence, where a_n is the number of points needed to complete level n.

    a. player needs 1000 points to complete level 2 and 20000 points to complete level 3. Write an explicit rule for the sequence.

    b. How many points are needed for level 7?