Practice 14.2

For each sequence, state if it is arithmetic, geometric, or neither.If it is arithmetic, tell the common difference. If it is geometric, tell the common ratio. If it is neither, chill out and move on to the next problem.

1) $-1,\ 6,\ -36,\ 216,\ -1296,\ ...$

2) $11,\ -9,\ -29,\ -49,\ -69,\ ...$

3) $2,\ \frac{5}{2},\ 3,\ \frac{7}{2},\ 4,\ ...$

4) $-6,\ 24,\ -126,\ 624,\ -3126,\ ...$

5) $32,\ 36,\ 40,\ 44,\ 48,\ ...$

6) $0.4,\ 2,\ 10,\ 50,\ 250,\ ...$

7) $a_n = -\frac{19}{24} + \frac{5}{3}n$

8) $a_n = 8 + 6n$

9) $a_n = 3 \cdot (-6)^{n-1}$

10) $a_n = \frac{2n}{2n+1}$

Determine if the sequence is arithmetic. If it is, find the common difference, the term named in the problem, and the explicit formula.

11) $10,\ 16,\ 22,\ 28,\ ...$
Find a_{25}

12) $-31,\ -33,\ -35,\ -37,\ ...$
Find a_{35}

13) $1,\ 2,\ 6,\ 24,\ ...$
Find a_{20}

Determine if the sequence is geometric. If it is, find the common ratio, the term named in the problem, and the explicit formula.

14) $1,\ 4,\ 16,\ 64,\ ...$
Find a_9

15) $-7,\ -5,\ -2,\ 2,\ ...$
Find a_{10}

16) $1,\ -2,\ 4,\ -8,\ ...$
Find a_{10}

For numbers 16 – 20, find the sum of the first ***n*** terms indicated in part (a). Then, for part (b), find ***n*** for the given sum S_n.

17. 1 + 4 + 16 + 64 + ….
   a. *Sum of the first 14* terms?
   b. For which term would $S_n = 341$?

18. 50 + 42 + 34 + 26 + …
   a. *Sum of the first 40* terms?
   b. For which term would $S_n = 182$?

19. 7 + (-21) + 63 + (-189) + …
   a. *Sum of the first 84* terms?
   b. For which term would $S_n = 3829$?

20. 2 + 16 + 30 + 44 + 58 + …
   a. *Sum of the first 24* terms?
   b. For which term would $S_n = 2178$

21. 1 + 9 + 81 + 729 + ….
   a. *Sum of the first 10* terms?
   b. For which term would $S_n = 820$?

22. 3 + 8 + 13 + 18 + 23 + …
   a. *Sum of the first 20* terms?
   b. For which term would $S_n = 366$?

Evaluate each series.

23. $\sum_{i=2}^{7} i + 2$

24. $\sum_{j=1}^{3} j^j$

25. $\sum_{k=3}^{5} t^k$

Write each series in sigma notation.

26. 16 + 25 + 36 + 49 + 64

27. 2 + 4 + 8 + 16 + 32

28. 501 + 502 + 503 + 504

Skillz Review! Write the equation of a line with the given slope that passes through the given point.

In slope-intercept form: $y = mx + b$		In point-slope form: $y - y_1 = m(x - x_1)$	
1. slope = -3; through (-1,3)	**2. slope = 0; through (-2,3)**	**3. slope = 3; through (1,-3)**	**4. slope = $-\frac{3}{5}$; through (0,0)**

14.2 Arithmetic and Geometric Sequences Application

1. Given one example of a sequence that would be arithmetic and one example that would be geometric.

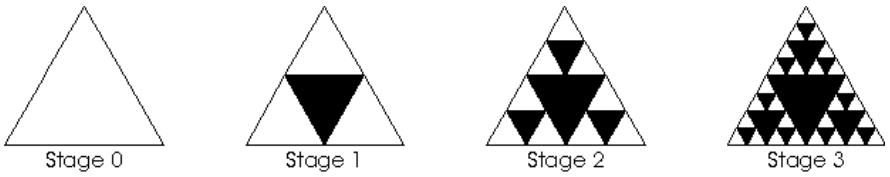
2. Find the sum of the first 18 terms of the arithmetic series $1 + 5 + 9 + 13 + \ldots$

3. Next year, the Algebros' ***MarchMathness*** tournament will be bigger than ever! In the first round, 64 games will be played. In each successive round, the number of matches played decreases by one half.

   a. Find a rule for the number of games played in the *n*th round. For what values of n does your rule make sense?

   b. Find the total number of games that will be played.

4. The Sierpinski triangle is a design using equilateral triangles. The process involves removing smaller triangles from larger triangles by joining the midpoints of the sides of the larger triangles as shown below. Assume that the initial triangle is equilateral with sides 1 unit long.



   a. Let a_n be the number of triangles removed at the nth stage. Find a rule for a_n. Then find the total number of triangles removed through the 10^{th} stage.

   b. Let b_n be the remaining area of the original triangle at the nth stage. Find a rule for b_n. Then find the remaining area of the original triangle at the 15^{th} stage.