

DO NOW

Write an explicit and a recursive formula for this sequence:
 $a_1 = 4$ $d = 10$ {4, 14, 24, 34, ...}

Explicit $a_n = 4 + 10(n-1)$

Recursive $a_1 = 4; a_n = a_{n-1} + 10$

Feb 24-11:18 AM

1) There is a stack of logs in the backyard. There are 15 logs in the 1st layer, 14 logs in the 2nd layer, 13 logs in the 3rd layer and so on with the last layer having one log. How many logs are in the 10th layer?

$a_1 = 15$
 $d = -1$

15, 14, 13, ...

$a_n = a_1 + d(n-1)$
 $a_n = 15 - 1(n-1)$
 $a_{10} = 15 - 1(10-1)$
 $a_{10} = 15 - 1(9)$
 $a_{10} = 15 - 9$
 $a_{10} = 6$

Feb 24-11:15 AM

2) A Greek theater has 30 seats in the first row of the center section. Each row behind the first row gains two additional seats. How many seats are in the 5th row in the center section?

$d = 2$
 $a_1 = 30$

$a_n = a_1 + d(n-1)$
 $a_{15} = 30 + 2(5-1)$
 $a_{15} = 30 + 2(4)$
 $a_{15} = 30 + 8$
 $a_{15} = 38$

Feb 24-10:57 AM

3) Your grandmother gives you \$1000 to start a college book fund. She tells you she will add \$200 to the fund each month, if you will add \$5 each month. After how many months will the college book fund have \$5715?

$a_0 = 1000$
 $a_1 = 1205$
 $d = 205$

$a_n = 1205 + 205(n-1)$
 $5715 = 1205 + 205(n-1)$
 $5715 = 1205 + 205n - 205$
 $5715 = 1000 + 205n$
 $-1000 \quad -1000$
 $4715 = 205n$
 $\frac{4715}{205} = \frac{205n}{205}$
 $n = 23 \text{ months}$

Feb 24-11:03 AM

4) Mr. Carlson suffers from allergies. When allergy season arrives, his doctor recommends that he take 300 mg of his medication the first day, and decrease the dosage by one half each day for one week. To the nearest milligram, what is the amount of medication Mr. Carlson will take on the 7th day?

$a_1 = 300 \text{ mg}$
 $r = \frac{1}{2}$

$a_n = a_1 (r)^{n-1}$
 $a_7 = 300 \left(\frac{1}{2}\right)^{7-1}$
 $a_7 = 300 \left(\frac{1}{2}\right)^6$
 $a_7 = 4.6875$
 $a_7 = 5 \text{ mg}$

Feb 26-10:30 AM

5) A research lab is to begin experimentation with a bacteria that doubles every 4 hours. The lab starts with 200 bacteria. How many bacteria will be present at the end of the 12th hour?

$a_0 = 200$
 $r = 2$

$a_n = a_1 (r)^{n-1}$
 $a_3 = 400 (2)^{3-1}$
 $a_3 = 400 (2)^2$
 $a_3 = 1600$

3rd term

Feb 26-10:32 AM

6) Suppose you drop a tennis ball from a height of 15 feet. After the ball hits the floor, it rebounds to 85% of its previous height. How high will the ball rebound after its third bounce? Round to the nearest tenth.

geometric $r = .85$

$$a_0 = 15$$

$$a_n = a_1(r)^{n-1}$$

$$a_1 = .85(15)$$

$$a_1 = 12.75$$

$$a_n = 12.75(.85)^{n-1}$$

$$a_3 = 12.75(.85)^{3-1}$$

$$a_3 = 12.75(.85)^2$$

$$a_3 = 9.2 \text{ ft}$$

Feb 26-10:35 AM

7) George has taken a job with a starting salary of \$50,000. Find his salary during his fourth year on the job if he receives an annual raise of 2%.

$$a_1 = 50,000$$

$$r = 1.02$$

$$a_n = a_1(r)^{n-1}$$

$$a_4 = 50000(1.02)^{4-1}$$

$$a_4 = 50000(1.02)^3$$

$$a_4 = \$53,060.40$$

Feb 26-10:39 AM

Mar 3-7:45 AM