Warm Up

1. Find the common difference: 5, 12, 19 ...

① $CD=7$

2. Identify whether the following sequence is arithmetic or geometric: 5, -10, 20, -40

② geometric

3. Solve the following: log5 + log4x = 2

$x=5$

$\log 20x = 2$ $10^2 =$

$\dfrac{100}{20}$

4. Identify the center and the radius of the following circle: $(x - 8)^2 + (y + 10)^2 = 144$

$(8,-10)$ $r = ,12$

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$A(t) = a(1 \pm r)^t$

$r = .056$

$a = 700$

$A(t) = 1000$

$\dfrac{1000}{700} = \dfrac{700(1+.056)^t}{700}$

$1.42 = 1.056^t$ $\log_{1.056} 1.42 = t$

$\dfrac{\log 1.42}{\log 1.056} = t$

$t = 6.44$

Series Review - Player/Coach

1. Write the equation of the following:
   5, 10, 15, ...

$a_n = 5 + (n-1)5$

2. Write the equation of the following:
   12, 36, 108 ...

$a_n = 12(3^{n-1})$

3. Find the sum of the following series to 101 terms: 7, 4, 1 ...

① $a_n = -293$ $S_n = \dfrac{101}{2}(7 + -293)$

$S_n = -14,443$

4. Find the sum of the following to 8 terms:
   8, 16, 32 .... $S_n = \dfrac{8(1-2^8)}{(1-2)} = 2040$

5. A stadium has designed its seating to increase every row. The first row has 15 seats, the second row has 17, and the third row has 19 seats. Find the total number of seats in the stadium if the stadium has 20 rows.

$$a_n = 53 \quad S_n = \frac{20}{2}(15+53) = 680$$

6. A game board is designed with a geometric pattern. The board has 8 squares. The first square contains 2 circles, the second square contains 6 circles, and the third square contains 18 circles. How many circles are there in total?

$$S_n = \frac{2(1-3^8)}{1-3} = 6560$$

$$\mu = 58 \quad \sigma = 4 \quad x_1 = 53 \quad x_2 = 66$$

$$z_1 = \frac{53-58}{4}$$

$$z_1 = \frac{-5}{4} = -1.25$$

$$z_2 = \frac{66-58}{4}$$

$$z_2 = \frac{8}{4} = 2$$

2. A university will only admit students with an SAT score 2 standard deviations about the average. If the average SAT score is 1010 and the standard deviation is 120, what must the student's score be?

$$\mu = 1,010 \quad \sigma = 120 \quad z = 2$$

$$120 \cdot 2 = \frac{x - 1,010}{120} \cdot 120$$

$$240 = x - 1,010 \qquad x = 1,250$$

3. The average score on a biology exam was 76 with a standard deviation of 4 and the average score on a chemistry exam was 72 with a standard deviation of 7. If a student receives a 79 on the biology and a 78 on the chemistry, which test does the student do better on compared to the average? (higher z-score)

Chem ✓

BIO
$$\mu = 76 \quad \sigma = 4$$
$$x_1 = 79$$

$$\mu_2 = 72 \quad \sigma_2 = 7$$
$$x_2 = 78$$

$$z_1 = \frac{79-76}{4} = .75$$

$$z_2 = \frac{78-72}{7} = .875$$