SM3 Unit 10 Review

1) $a_n = 7, -1, -9 \cdots$
Is a_n an arithmetic or geometric sequence?

How many terms are in the sequence:

Explicit Formula:

Find a_{12}:

What is the sum of the first 5 terms of the sequence a_n?

2) $b_n = 4, \frac{-2}{3}, \cdots \frac{1}{11664}$
Is b_n an arithmetic or geometric sequence?

How many terms are in the sequence:

Explicit Formula:

Find b_8:

What is the sum of the first 8 terms of the sequence b_n

3) Rewrite the following series using sigma notation.
a) $4 + 24 + 144 + \cdots + 186{,}624$

b) $360 + 180 + 90 + \cdots + 5.625$

c) $-6 + 24 + -96 + \cdots + -393216$

4) Determine the sum of each finite geometric series.

$$\sum_{n=1}^{6} 2\,(3)^n$$

$$\sum_{n=4}^{7} 5(2)^{n-1}$$

$$7 + 1 + \frac{1}{7} + \cdots + \frac{1}{2401}$$

5) Determine if the series converges or diverges. If it converges find the sum.

$$\sum_{n=1}^{\infty} 2\left(-\frac{5}{3}\right)^n$$

$$\sum_{n=1}^{\infty} 3\left(-\frac{1}{2}\right)^n$$

$$2 + 3 + \frac{9}{2} + \cdots$$

$$40 + 16 + \frac{32}{5}\cdots$$

6) You drop a particularly bouncy ball from a height of 80 feet. The ball is so bouncy, that each time it hits the ground, it returns to a height that is $\frac{2}{3}$ of the most recent height. As the ball continues bouncing, what is the total distance travelled by the ball approaching? (Hint: the ball moves up and down, which makes the problem more complicated)

7) Mr. Stewart deposits $10,000 into a bank account that has a 3.5% interest rate, compounded monthly. How much money is in the account after 6 months have passed?

8) Which improper fraction is equal to $5.\overline{13}$

9) Satellites observe that there are 750 million hectares of rain forest on the planet. The average deforestation rate is 0.68%. Which expression is equal to the number of hectares, in millions, of rain forest remaining after 5 years have passed?

A $750(0.0068)^5$

B $750(0.0068)^4$

C $750(0.9932)^5$

D $750(0.9932)^4$

10) A small squirrel near the top of the mountainside is relaxing inside its home with acorns during the harsh winter months. The squirrel carelessly spits an acorn with volume 1 in^3 from its mouth and the acorn lands in the soft powdered snow. The momentum of the fall causes the acorn to roll through the snow while the saliva causes the powdered snow to adhere to the acorn forming a snowball. For every second the acorn rolls, the volume of the snowball doubles! The snowball rolls for 10 seconds before colliding with a tree and stopping. How large is the snowball when it impacts the tree?