Homework questions

Lott #1 $u_1 = 4$, $S_{30} = 1425$

find d

$$S_n = \frac{n}{2}(2u_1 + (n-1)d)$$

$$1425 = \frac{30}{2}(2(4) + (29)d)$$

$$1425 = 15(8 + 29d)$$

$$1425 = 120 + 435d$$

$$435d = 1305$$

$$d = 3$$

#3 $u_1 = -30$, $d = 3.5$

$$S_n = \frac{n}{2}(2(-30) + (n-1)3.5)$$

$$S_n = \frac{n}{2}(-60 + (n-1)3.5)$$

$$105 = \frac{n}{2}(-60 + 3.5n - 3.5)$$

$$210 = n(-63.5 + 3.5n)$$

$$210 = -63.5n + 3.5n^2$$

use quadratic equation

$$n = 21$$

Cornell Notes	Topic/Objective: 6.6 Geometric Series	Name:
AVID Decades of College Dreams		Class/Period: 4
		Date: 4/24/16

Essential Question: How does a Geometric Series differ from an arithmetic series?

Questions:	Notes:
	Just as an arithmetic series is the sum of its terms, a Geometric series is the sum of the terms of a Geometric sequence.
	$S_n = u_1 + u_1 r + u_1 r^2 + u_1 r^3 + \cdots u_1 r^{n-1}$
	↓
	Math magic happens p. 175
	↓
	so that
	YOU CAN FIND THE SUM OF THE FIRST n TERMS OF A GEO SERIES BY USING:
	$S_n = \frac{u_1(r^n - 1)}{r - 1}$ ← use when $r > 1$
	or
	$S_n = \frac{u_1(1 - r^n)}{1 - r}$

Questions:	Notes:
	Ex) Calculate the first 12 terms of the series $1+3+9+\ldots$
	$u_1 = 1 \quad , r = 3$
	$S_{12} = \frac{1(3^{12}-1)}{3-1} = 265,720$
	Ex) Calculate the value of S_{20} of the series $3 - 6 + 12 - 24 + \ldots$
	$u_1 = 3 \quad r = -2$
	$r = \frac{-6}{3} = -2 \qquad r = \frac{12}{-6} = -2$
	$S_n = \frac{u_1(1-r^n)}{1-r}$
	$S_{20} = \frac{3(1-(-2)^{20})}{1-(-2)} = 1048577$

Questions:	Notes:

$S_{12} = 10\, S_3$

$u_1 = 5$, $d = \_\_$ $\quad S_{20} = \_\_\_\_$

$S_n = \frac{n}{2}(2u_1 + (n-1)d)$ $\quad \left[\frac{3}{2}(2(5)\right.$

$\frac{12}{2}(2(5)+(11)d) = 10\left[\frac{3}{2}(2(5)+(2)(d)\right]$ $\quad \frac{n}{2}(2u_1 + (n-1)d)$

$6(10+11d) = 10(15+3d)$

$60 + 66d = 150 + 30d$

$36d = 90$

$d = 90/36 = 2.5$

Questions:	Notes:

Ex 1 Find the number of terms in the series $8192 + 6144 + 4608 + \ldots + 1458$

$u_1 = 8192$ $\quad r = \frac{6144}{8192} = \frac{3}{4}$ $\quad \downarrow n?$

$u_n = u_1(r^{n-1})$

give the term value for a particular n in a sequence

$$\frac{1458}{8192} = \frac{8192\left(\frac{3}{4}^{n-1}\right)}{8192}$$

$$\frac{1458}{8192} = \frac{3}{4}^{(n-1)}$$

$$\ln\left(\frac{1458}{8192}\right) = (n-1)\ln\left(\frac{3}{4}\right)$$

$$\ln\left(\frac{1458}{8192}\right) = n\ln\left(\frac{3}{4}\right) - \ln\left(\frac{3}{4}\right)$$

$$\frac{\ln\left(\frac{1458}{8192}\right) + \ln\left(\frac{3}{4}\right)}{\ln\left(\frac{3}{4}\right)}$$

$n = 7$

Questions:	Notes:
	Ex) least value of n for which $S_n > 500$ in the series $3 + 3\sqrt{2} + 6 + 6\sqrt{2} + \cdots$
	$u_1 = 3$
	$r = \sqrt{2}$
	$S_n = \frac{3(\sqrt{2}^n - 1)}{\sqrt{2} - 1}$
	$n = 13$
	HW18 6I p176 1ad,2bd,3 6J p178 1ac,2,3,4