

know $S_5 = \frac{u_1(1-r^5)}{1-r} = \underline{3798}$ $S_7 =$

$$S_{\infty} = \frac{u_1}{1-r} = 4374 \quad \begin{array}{l} u_1 = \\ r = \end{array}$$

$$(1-r^5) \frac{u_1}{1-r} = \underline{4374(1-r^5)}$$

$$\frac{4374(1-r^5)}{4374} = \frac{3798}{4374}$$

$$\frac{u_1}{1-\frac{2}{3}} = 4374$$

$$\frac{u_1}{\frac{1}{3}} = 4374$$

$$u_1 = 1458$$

$$1 - r^5 = \frac{3798}{4374} - 1$$

$$r^5 = -\frac{3798}{4374} + 1$$

$$r = \frac{2}{3}$$

Cornell Notes



Topic/Objective:

6.8 Applications of Geometric + Arithmetic patterns

Name:

Class/Period:

4

Date:

5/1/17

Essential Question:

What are some of the applications of sequences & series?

Questions:

Notes:

① Compound Interest.

$$A = P \left(1 + \frac{r}{n}\right)^{nt}$$

P = Principal

r = Interest rate

n = # times compounded annually

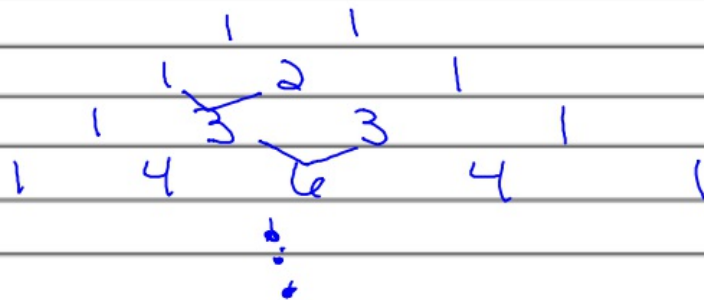
t = # of years

Ex) In a geometric sequence $v_1 = 6, r = 1.5$
In an arith. seq, $u_1 = 75$ and $d = 100$
after how many terms will the
Sum of the geo seq > Sum arith?

6.8 p. 82
1-4

$$S_{Geo} \frac{6(1.5^n - 1)}{1.5 - 1} > \frac{n}{2} (2(75) + (n-1)100)$$

6.9 Pascal's Triangle



to be continued...

$$1. \begin{aligned} u_6 &= 3u_4 \\ u_8 &= 50 \\ u_1 &= \end{aligned}$$

$$u_8 = u_6 + 2d$$

$$u_8 = u_1 + 7d$$

$$50 = -2d + 7d$$

$$d = 10$$

$$2. \begin{aligned} u_1 &= 12, \quad u_5 = 15 \end{aligned}$$

$$u_5 = u_1 + 4d$$

$$15 = 12 + 4d$$

$$d = \frac{3}{4}$$

$$3. \quad A = p \left(1 + \frac{r}{n}\right)^{nt}$$

$$p = 2500$$

$$r = 0.06$$

$$t = 8$$

$$a. \quad n = 1$$

$$b. \quad n = 4$$

$$c. \quad n = 12$$

$$u_n = u_1 + (n-1)d$$

$$u_4 = u_1 + 3d$$

$$u_6 = 3u_4 = 3(u_1 + 3d)$$

$$u_6 = u_1 + 5d$$

$$u_1 = -2d$$

$$u_1 = -20$$

$$a. \quad u_{20} = u_1 + 19d$$

$$b. \quad u_n \geq 100$$

$$12 + (n-1)\left(\frac{3}{4}\right) \geq 100$$

$$n > 118$$

$$\underline{119}$$

Questions:

Notes:

Combinations

- primarily in probability

a combination of n items taken r at a time is written

$${}_n C_r, \binom{n}{r}, \text{ or } C_r^n$$

* Recall:

$$P(\text{Event}) = \frac{\text{\# of ways an event can happen}}{\text{Total \# of poss. outcomes}}$$

Ex/ 5 balls, 1Y, 1R, 1B, 1G, 1P
How many ways can 2 balls be chosen?

- YR YB YG YP
- RB RG RP 10
- BG BP
- GP

$$5! = 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1$$

$$\frac{5!}{5 \cdot 4!}$$

Combinations

1. by hand $\binom{n}{r} = {}_n C_r$
 $= \frac{n!}{r!(n-r)!}$

ex $n=5, r=2$

$$\binom{5}{2} = \frac{5!}{2!(5-2)!}$$

$$= \frac{5 \cdot 4 \cdot \cancel{3!}}{2 \cdot 1 \cdot \cancel{3!}} = 10$$

2 By Calculator

HW 6M
p. 185
1-6