

HM321 Engineering Economics

Fall 2024 – Lecture 6

Instructor: Dr. Ali Ahmad



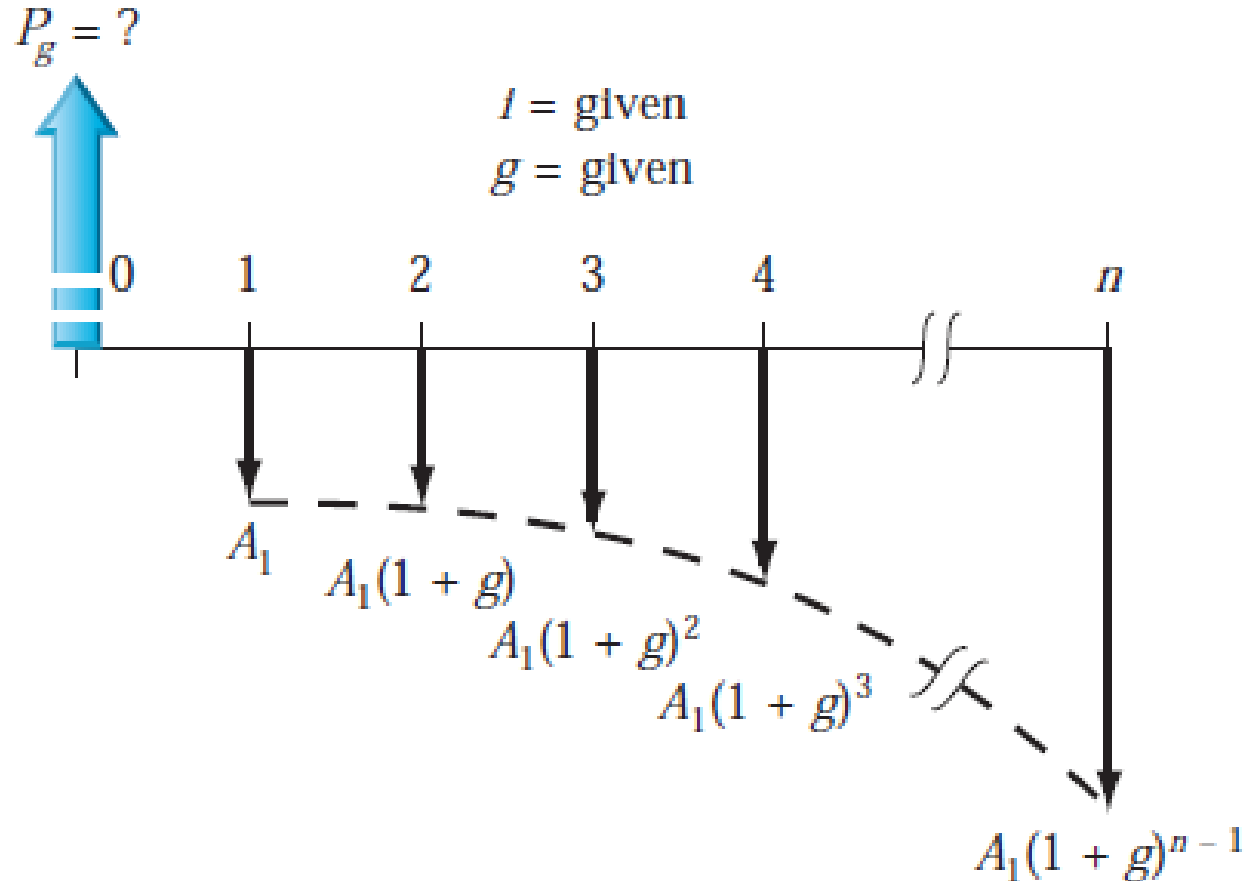
Bring Calculator Always

- Always bring your calculator with you in lectures
- Without practice you will not be able to do the calculations in your exams

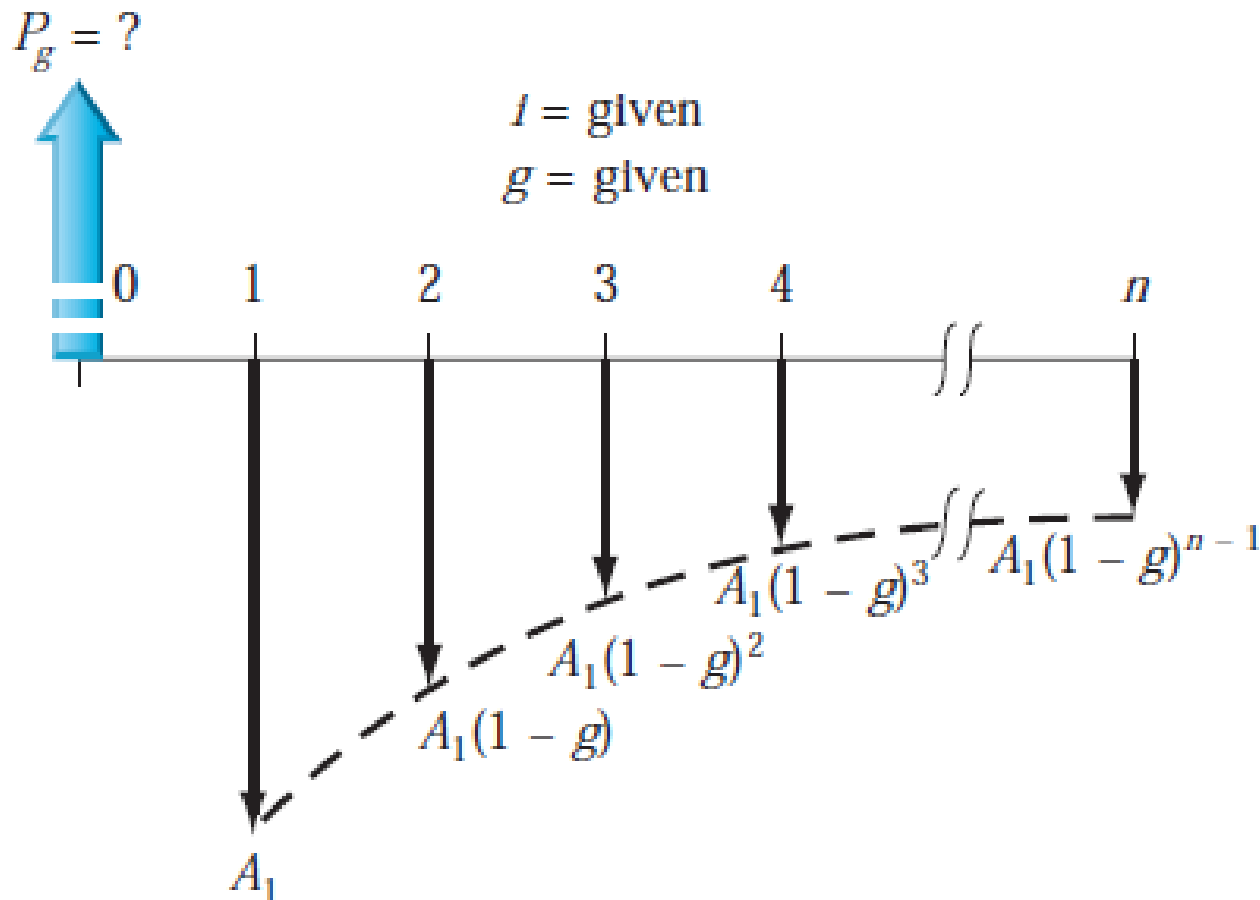
Geometric Gradient Series Formulas

- A geometric gradient series of n payments:
 - The first payment is non-zero. Denoted by A_1
 - Each successive payment is a constant multiple of the previous payment
 - The constant of multiplication is specified as $(1 + g)$
 - If $g > 0$ then it is increasing geometric gradient series
 - If $g < 0$ then it is decreasing geometric gradient series
 - The payments are: $A_1, A_1(1+g), A_1(1+g)^2, \dots, A_1(1+g)^{n-1}$
- There are no tabulated factors for geometric gradient series

Cash Flow Diagram for Increasing Geometric Gradient Series



Cash Flow Diagram for Decreasing Geometric Gradient Series



Present Worth of a Geometric Gradient Series ($g \neq i$)

- The following formula gives the present worth P of a geometric gradient series
- This formula is applicable only when $g \neq i$

$$P = A_1 \left[\frac{1 - \left(\frac{1+g}{1+i} \right)^n}{i - g} \right] \quad \text{when } g \neq i$$

Present Worth of a Geometric Gradient Series ($g = i$)

- The formula on the last slide fails when $g = i$
- If $g = i$, then the present worth of a geometric gradient series is given by:

$$P = \frac{nA_1}{1+i} \quad \text{when } g = i$$

Reference

- Basics of Engineering Economy by Leland Blank and Anthony Tarquin, 2nd edition, McGraw-Hill