

Project Path Finder

Plan tasks, spot the critical path, and build schedules.

HIGH SCHOOL • MA.912.LT.2.3

MA.912.LT.2.3 "Solve scheduling problems using critical path analysis and Gantt charts. Create a schedule using critical path analysis."

NAME _____

DATE _____

FIND THE LONGEST PATH

A task starts only after every task before it is finished. Add the times on each path. The longest path is the critical path, and it gives the project length. In a Gantt schedule, list each task's start and finish time.

WORKED EXAMPLE

Task A takes 11 days. Tasks B and C both begin after A. B takes 13 days, and C takes 8 days. Find the critical path and project length.

1. A finishes after 11 days.
2. B finishes after $11 + 13 = 24$ days.
3. C finishes after $11 + 8 = 19$ days.
4. Path A-B is longer than path A-C.

Answer: Critical path: A-B. Project length: 24 days.

PRACTICE 5 problems

- 1** Task A takes 4 days. Task B takes 10 days after A. What is the project length?

ANSWER _____

- 2** Task A takes 9 days. Tasks B and C begin after A. B takes 2 days, and C takes 5 days. On what day does C finish if A starts on Day 1?

ANSWER _____

- 3** A takes 4 days. B takes 10 days after A, and C takes 6 days after A. What is the critical path?

ANSWER _____

- 4** Starting at time 0, make a Gantt schedule as start-finish times: A takes 4 days, B takes 5 days after A, and C takes 6 days after B.

ANSWER _____

- 5** A takes 9 days and B takes 4 days, both starting on Day 1. C takes 12 days after A. D takes 2 days after B. E takes 5 days after both C and D. Find the critical path and project length.

ANSWER _____

APPLY IT Show your work

- 1** The drama club is planning a concert. Posters take 4 days and auditions take 5 days, both starting on Day 1. Rehearsals take 9 days after auditions. The program takes 2 days after both posters and auditions. A final check takes 4 days after rehearsals and the program. Write a Gantt schedule using Day ranges. Then find the critical path and finish day.

WORK SPACE

ANSWER _____

- 2** A student podcast team has 5 days for research, then 4 days to record. Cover art takes 2 days and can start on Day 1. Editing takes 6 days after recording. Uploading takes 3 days after editing and cover art. Write a Gantt schedule using Day ranges. Then find the critical path and finish day.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Starting on Day 1, A takes 5 days. B takes 6 days after A, and C takes 4 days after A. D takes 3 days after B. E takes 7 days after C. F takes 2 days after both D and E. Make a schedule, identify the critical path, and state how many days the B-D branch can be delayed without delaying the project.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Task A takes 4 days. Task B takes 10 days after A. What is the project length?	14 days
2	Task A takes 9 days. Tasks B and C begin after A. B takes 2 days, and C takes 5 days. On what day does C finish if A starts on Day 1?	Day 14
3	A takes 4 days. B takes 10 days after A, and C takes 6 days after A. What is the critical path?	A-B, 14 days
4	Starting at time 0, make a Gantt schedule as start-finish times: A takes 4 days, B takes 5 days after A, and C takes 6 days after B.	A: 0-4; B: 4-9; C: 9-15
5	A takes 9 days and B takes 4 days, both starting on Day 1. C takes 12 days after A. D takes 2 days after B. E takes 5 days after both C and D. Find the critical path and project length.	A-C-E, 26 days

PART 2 • APPLY IT

- Posters: 1-4; Auditions: 1-5; Rehearsals: 6-14; Program: 6-7; Final check: 15-18. Critical path: Auditions-Rehearsals-Final check. Finish: Day 18.** Schedule each task after its required tasks. Rehearsals, not the program, control the start of the final check.
- Research: 1-5; Record: 6-9; Cover art: 1-2; Edit: 10-15; Upload: 16-18. Critical path: Research-Record-Edit-Upload. Finish: Day 18.** Editing must wait for recording, and uploading must wait for editing and cover art. The research, recording, editing, and upload chain is longest.

CHALLENGE

A: 1-5; B: 6-11; C: 6-9; D: 12-14; E: 10-16; F: 17-18. Critical path: A-C-E-F. The B-D branch can be delayed 2 days because it finishes on Day 14, while F cannot start until Day 17.

Accept equivalent Gantt bars or start-finish tables. For schedules, accept time 0 notation if all dependency relationships and project lengths are correct.