

QUICK REVIEW

Quick Review: Thermodynamic Processes and PV Diagrams — Foundational

Refresh the most important ideas, formulas, and problem-solving strategies for Thermodynamic Processes and PV Diagrams in just a few minutes.

 TIME 5–10 minutes	 BEST FOR A rapid refresh	 FINISH WITH Key ideas refreshed
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After this quick review, you'll be able to...

quickly recall the essential concepts, formulas, and problem-solving strategies needed to move forward with confidence.

HOW TO USE THIS GUIDE

Work through the four stages in order. Write directly in the spaces provided, check your work in the Quick Answers section, and finish by choosing the next resource that matches your confidence.

Choose how you want to review: work through this guide, follow the online review, or watch the video review.

[Start the Review Online →](#)

[Watch the Video Review →](#)

YOU WILL NEED

Pencil or pen • Calculator if needed • Approximately 5–10 minutes

FR-02 • COURSE ALIGNMENT

Course Alignment

This Physics Sensei Unit Review is an independent learning resource. Use it to reinforce key concepts, prepare for homework, or review before a quiz or exam.

RESOURCE: Physics Sensei Unit Review
UNIT ID: THM-U09
TOPIC: Thermodynamic Processes and PV Diagrams
COURSE LEVEL: Foundational

BEST USED

- ✓ After learning the unit
- ✓ Before starting homework
- ✓ Before a quiz or exam

FR-03 • YOUR REVIEW PLAN

Your Review Plan

Complete these four stages to quickly refresh the essential ideas and confirm you're ready to continue.

4 stages • Approximately 5–10 minutes

1 Quick Recall Refresh what you already know.	2 Essential Idea Review the most important concept.
3 Confidence Check Confirm you're ready to move on.	4 Next Step Continue your learning.

PRINTING TIP

For student copies, print double-sided and keep the Quick Answers section after the student activities so learners attempt each activity before checking their work.

FR-04 • STAGE 1 OF 4

Quick Recall

Let's quickly refresh what you already know. This short recall activity will bring the most important ideas back to mind before you review them.

QUICK RECALL**Recall Activity**

Name the process from what stays fixed, then interpret the P - V path.

Match each cue: constant volume, constant pressure, constant temperature, and no heat transfer. Then state what motion to the right means on a P - V diagram.

Ready to refresh the essentials?

Great! Now review the most important idea you'll want to remember.

Review the Essential Idea →

FR-05 • STAGE 2 OF 4

Essential Idea

Take one last look at the most important concept from this topic. If you remember this idea, the rest will come back much more easily.

ESSENTIAL IDEA**Process constraints and P–V work belong together**

A thermodynamic process is identified by its constraint. On a pressure–volume diagram, expansion moves to the right and compression moves to the left. Work by the gas is connected to the area under the path; a vertical constant-volume path has zero work.

Process cues: $\Delta V = 0$ • $\Delta P = 0$ • $\Delta T = 0$ • $Q = 0$; P–V work comes from area under the path.

EXAMPLE A vertical path is isochoric. Because volume does not change, the gas does no boundary work during that path.

SENSEI NOTE Do not identify a process only by whether pressure rises or falls. Start with the quantity that is fixed or the energy-transfer condition.

Ready to check your memory?

You've refreshed the essential idea. Now see how much you remember before moving on.

Start the Confidence Check →

FR-06 • STAGE 3 OF 4

Confidence Check

You've refreshed the essential idea. Now answer this quick confidence check to confirm you're ready to move on.

CONFIDENCE CHECK

Read one P–V path

Identify the process and the sign of the work.

A gas follows a horizontal path to the right on a P–V diagram. What process is shown, and is the work by the gas positive, negative, or zero?

Ready for your next step?

Great work! You've refreshed the essential idea. Now choose the resource that best matches what you'd like to do next.

Choose Your Next Step →

QUICK ANSWERS • CHECK AFTER ATTEMPTING

Quick Answers and Explanations

Use these concise answers to check your recall and confidence—not only your final response.

QUICK RECALL**Recall Activity**

Constant volume → isochoric; constant pressure → isobaric; constant temperature → isothermal; no heat transfer → adiabatic. Motion to the right is expansion.

WHY IT WORKS The process name tells you the constraint; the P–V path shows how pressure and volume change together.

CONFIDENCE CHECK**CONFIDENCE CHECK****Read one P–V path**

The process is isobaric expansion, and the work by the gas is positive.

WHY IT WORKS A horizontal P–V path has constant pressure. Moving right increases volume, so the gas expands and does positive work.

READINESS GUIDE

1 correct: You're ready to continue. • 0 correct: Revisit the Essential Idea or choose more practice.

FR-07 • STAGE 4 OF 4

Next Step: Continue Learning

Great work! You've completed this quick review. Choose the next resource that best matches how confident you feel.

? I'm Still Unsure Review the essential idea again. Review Again →	🎯 I Need More Practice Continue with additional practice for this topic. Go to Practice →	✓ I'm Ready Continue to the next recommended resource. Continue →
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RECOMMENDED LINKS

Review this topic again →

Find additional practice →

Choose another type of physics help →

Continue reviewing with these companion resources.

Start the Review Online →

Watch the Video Review →

PHYSICS HELP THAT MAKES SENSE

A Physics Sensei review never ends at the last question. It always guides you toward the next useful step.

PhysicsSensei.com