

AP Physics 1 2020 Remote-Exam Style Practice Paper

2020 remote-exam style practice paper

Original practice paper. Every question in this PDF was written for Salar Cafe. It does not reproduce official AP exam wording. Models the exceptional 2020 at-home AP Physics 1 format: two timed free-response tasks, with 25 minutes for Question 1 and 15 minutes for Question 2. There was no normal multiple-choice section in this emergency format.

Question 1	Qualitative/Quantitative Translation - 25 response minutes + 5 submission minutes - approximately 60%
Question 2	Paragraph Argument Short Answer - 15 response minutes + 5 submission minutes - approximately 40%
Multiple choice	None in the exceptional 2020 remote format.
Calculator	Scientific or graphing calculator may be used for this practice paper.
Scoring	FRQ scoring guidance is included after the two-question paper.

Topic emphasis

Conical-pendulum qualitative/quantitative translation; vertical spring energy-system paragraph argument.

2020 REMOTE FREE-RESPONSE PRACTICE

Two questions. Time Question 1 for 25 minutes, then Question 2 for 15 minutes. To mimic the 2020 administration, do not return to Question 1 after moving on.

Question 1 - Qualitative/Quantitative Translation: Conical pendulum (10 points)

- A.** A small mass moves at constant speed in a horizontal circle while attached to a string that makes angle θ with the vertical. Draw and label the forces on the mass.
- _____
- _____
- _____
- B.** Explain why the mass can have a horizontal centripetal acceleration even though neither tension nor weight is itself purely horizontal.
- _____
- _____
- _____
- C.** Derive expressions relating tension T to mg and the required inward force.
- _____
- _____
- _____
- D.** If the speed increases while string length stays fixed, predict how θ changes and justify using both force components and circular-motion reasoning.
- _____
- _____
- _____

Question 2 - Paragraph Argument: Vertical spring energy systems (7 points)

A. A block attached to a vertical spring is released from below equilibrium and moves upward. Compare the mechanical energy changes for these three systems: block only; block plus spring; block plus spring plus Earth.

B. Write a coherent paragraph explaining why the three answers differ even though they describe the same motion.

C. State one observable feature of a position-versus-time graph that indicates energy loss if damping is present.

SCORING GUIDE - Section II

This compact rubric emphasizes the evidence a strong AP-style response should contain. Equivalent correct reasoning should receive credit.

Question 1 - Qualitative/Quantitative Translation: Conical pendulum - 10 points

3 points: Only tension and weight act.

3 points: The horizontal component of tension supplies the inward net force while the vertical component balances weight.

2 points: $T \cos \theta = mg$ and $T \sin \theta = mv^2/r$.

2 points: Higher speed requires larger inward force, so the string must tilt farther from vertical, increasing θ .

Question 2 - Paragraph Argument: Vertical spring energy systems - 7 points

3 points: For block-only, external spring and gravity forces can change mechanical energy; for block+spring, gravity remains external; for block+spring+Earth, ideal mechanical energy is constant.

2 points: Correctly connects system boundary to which interactions are internal versus external and to energy transfer/work.

2 points: Decreasing oscillation amplitude over time indicates damping and mechanical-energy loss from the chosen mechanical system.

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