

AP Precalculus
Rational Function Word Problems

Rational Function Word Problems | APPC-U01-P22

96 problems · Four activity formats

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Topic focus

Across 96 tasks this topic asks for intensity model, model and invariant, model, concentrate fraction, concentration and domain and concentration model.

8 PDFs and a README; 54 buyer pages.

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Name: _____ Date: _____ Class: _____

Answer each question and record the matching bank letter. Give exact values. Give the whole requested response, including any reasoning the question asks for.

Express width in terms of a nonnegative design input x. For the answer bank, record the complete response required by the original task; use the given context to distinguish responses that share a numerical value. Context: rectangle. Area: 99. Dimensions: Length: $x + 2$; Width: w. _____ Bank label: _____	Model the juice fraction after adding only water. For the answer bank, record the complete response required by the original task; use the given context to distinguish responses that share a numerical value. Context: juice. Initial juice: 8. Initial volume: 20. Water added: x liters. _____ Bank label: _____
Construct average printing cost per ticket. For the answer bank, record the complete response required by the original task; use the given context to distinguish responses that share a numerical value. Context: tickets. Per ticket: 2. Quantity: positive tickets n. Setup: 500. _____ Bank label: _____	Model frequency from the fixed speed relation. For the answer bank, record the complete response required by the original task; use the given context to distinguish responses that share a numerical value. Context: waves. Relationship: fixed wave speed. Input: wavelength $\lambda > 0$. Speed: 340. _____ Bank label: _____
Express height for a nonnegative parameter x. For the answer bank, record the complete response required by the original task; use the given context to distinguish responses that share a numerical value. Context: triangle. Area: 54. Dimensions: Base: $x + 3$; Height: h. _____ Bank label: _____	Model concentration after adding pure water. For the answer bank, record the complete response required by the original task; use the given context to distinguish responses that share a numerical value. Context: cleaner. Initial solute: 15. Initial volume: 60. Water added: x. _____ Bank label: _____
Express the second side as a function of positive x. For the answer bank, record the complete response required by the original task; use the given context to distinguish responses that share a numerical value. Context: rectangle. Area: 144. Dimensions: Other side: y; Side: x. _____ Bank label: _____	Express height as a function of positive base. For the answer bank, record the complete response required by the original task; use the given context to distinguish responses that share a numerical value. Context: parallelogram. Area: 88. Dimensions: Base: b; Height: h. _____ Bank label: _____

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Answer each question and show your reasoning in the workspace. Give exact values rather than decimals unless the question supplies a decimal. Give the whole requested response, including any reasoning the question asks for.

Track salt and total liquid separately to build the concentration. Context: saline. Added concentration: 0.2. Added volume: x liters. Initial salt: 6. Initial volume: 30. 	Construct cost per poster and state the admissible inputs. Context: printing. Fixed cost: 240. Quantity: n positive posters. Variable cost: 3.
Model the completion time when both constant-rate pumps work together. Context: pumps. Relationship: parallel workers. Pump a time: 6. Pump b time: $b > 0$ hours. 	Audit the proposed blue concentration using units and feasible range. Context: paint. Blue: 4. Proposed: $\frac{10}{4}$. Total: 10.
Construct average cost and identify which term prevents a finite horizontal baseline. Context: manufacturing. Quantity: $q > 0$. Total cost: $C(q) = 500 + 4q + 0.02q^2$. 	Express height in terms of radius for the fixed-volume cylinder. Context: cylinder. Dimensions: Height: h; Radius: r. Volume: 200.

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Begin at START. Answer the card, then find the matching final answer at the top of another card. Use the recording sheet for your reasoning. Visit each card once and continue to FINISH.

START Build the simplest zero-baseline saturating ratio. Use the complete final response to identify the next Match & Move card; show the reasoning required by the original task. Context: advertising. Half limit input: 5. Limit: 80. Your response: _____	Incoming: $A(n) = \frac{2500}{n} + 30$ for integers $1 \leq n \leq 90$; the average remains above 30. Model concentration after dilution. Use the complete final response to identify the next Match & Move card; show the reasoning required by the original task. Context: soap. Initial volume: 44. Soap: 11. Water: x liters. Your response: _____
Incoming: $L(d) = \frac{288}{d^2}$ for $d > 0$. Construct cost per badge. Use the complete final response to identify the next Match & Move card; show the reasoning required by the original task. Context: badges. Fixed: 360. Per badge: 1.5. Quantity: positive whole n. Your response: _____	Incoming: $h(x) = \frac{180}{(x-3)(x+1)}$ for $x > 3$. Express length for $x \geq 0$. Use the complete final response to identify the next Match & Move card; show the reasoning required by the original task. Context: rectangle. Area: 168. Width: $x + 4$. Your response: _____
Incoming: $h(x) = \frac{84}{x-1}$ for $x > 1$. Model the equal amount per participant. Use the complete final response to identify the next Match & Move card; show the reasoning required by the original task. Context: shared budget. Participants: positive whole n. Total: 750. Your response: _____	Incoming: $I(d) = \frac{576}{d^2}$ for $3 \leq d \leq 18$. Construct a zero-start learning model with the specified half-saturation input. Use the complete final response to identify the next Match & Move card; show the reasoning required by the original task. Context: learning. Half limit practice: 8. Limit: 100. Your response: _____

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Evaluate the supplied statement or method. Say whether it is correct, repair it if it is not, and verify the result exactly. Not every prompt contains an error.

Express length as a function of positive width. Student work: $L(w) = \frac{72}{w}$ for $w \geq 0$. Identify the precise mathematical error or omitted condition, then complete the original task and verify the correction from the supplied givens. Context: rectangle. Area: 72. Dimensions: Length: L ; Width: w .

Model travel time from the fixed-distance invariant. Student work: $T(v) = \frac{180}{v}$ for $v \geq 0$. Identify the precise mathematical error or omitted condition, then complete the original task and verify the correction from the supplied givens. Context: travel. Distance: 180. Input: speed $v > 0$.

Identify the conservation mistake in the constant proposal. Identify the precise error or unsupported step in the stated claim or method, then give the corrected conclusion and justify it from the supplied information. Context: dye. Initial dye: 5. Initial volume: 25. Proposed: $\frac{5}{25}$. Water added: x .

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Full Worked Solutions - excerpt

Worked example

Problem. Track salt and total liquid separately to build the concentration. Context: saline. Added concentration: 0.2. Added volume: x liters. Initial salt: 6. Initial volume: 30.

Answer. $C(x) = \frac{6+0.2x}{30+x}$ for $x \geq 0$.

Explanation and check.

Added solution contributes both $0.2x$ salt and x total liters.

Worked example

Problem. Model concentration after dilution. Use the complete final response to identify the next Match & Move card; show the reasoning required by the original task. Context: soap. Initial volume: 44. Soap: 11. Water: x liters.

Answer. $C(x) = \frac{11}{44+x}$ for $x \geq 0$.

Explanation and check.

Water increases only the total volume.