

What a Model Does and Does Not Establish

Learn a table is evidence not a promise about every future value

These exact constructed pairs are consistent with 3 liters per minute: (1, 3), (2, 6), (4, 12). That means one k fits the displayed positive-time pairs. With no further rule, the pairs do not establish every future reading.

Possible rule consistent with those pairs	Reading at 6 minutes
Gain 3 liters each minute from empty through 6 minutes	18 liters
Gain 3 liters each minute through 4 minutes, then gain 2 liters each minute for the next 2 minutes	16 liters

Both possibilities fit the displayed pairs. The second changes after the last supplied time. A prediction of 18 liters is valid if the first rule is supplied or explicitly assumed; it is not established by the table alone.

Apply a supplied rule within its domain

A display uses 2-meter cord pieces. Display A contains only the new pieces. Display B contains those pieces plus an existing 4-meter cord. Let n be the number of new pieces, a whole number from 0 to 6. A has total length $2 \times n$; B has total length $2 \times n + 4$.

Which total is proportional to n ? State the constant where one exists. Find both totals for 3 pieces and explain why 3.5 pieces is outside the stated model.

Rules, totals and domain

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Practice qualify a prediction

An exact constructed record gives time/reading pairs (1 minute, 4 liters), (2 minutes, 8 liters), (4 minutes, 16 liters). The process and later rule are unknown.

Show that one k fits the displayed pairs. Is 20 liters at 5 minutes established? Give a conditional prediction and explain what additional condition would justify it.

Displayed evidence, condition and prediction

A zero pair alone

For a square, area in square centimeters equals side length in centimeters multiplied by itself. The pairs (0, 0), (1, 1), (2, 4) follow that rule. A fictional learner says, "There is a zero pair, so area is proportional to side length." Compare positive-side quotients and respond. A zero pair is necessary when zero is allowed, but it is not enough by itself.

Evidence and conclusion
