



Current Pre-Algebra PoW

The Math Forum's Problems of the Week provide non-routine constructed response problems. The Pre-Algebra problems target concepts typically learned in grades 6-8. Memberships and mentoring options are available at the individual, class, school, and district levels.

Postal Rates - posted April 7, 2008

Over the years, the cost to mail the most common type of letter in the United States has gone up. The price is scheduled to increase again by 1 cent on May 12, 2008.

The National Postal Museum lists the past postal rates shown in the table on the right.

On which of these dates was there the largest percentage increase in stamp price over the previous price?

- January 7, 1963
- January 7, 1968
- January 10, 1999
- January 7, 2001
- May 12, 2008

Extra: Consider all of the increases since 1958 instead of just the five listed above. Which was the largest percentage increase?

Effective Date	Cost (cents)
August 1, 1958	4
January 7, 1963	5
January 7, 1968	6
May 16, 1971	8
March 2, 1974	10
December 31, 1975	13
May 29, 1978	15
March 22, 1981	18
November 1, 1981	20
February 17, 1985	22
April 3, 1988	25
February 3, 1991	29
January 1, 1995	32
January 10, 1999	33
January 7, 2001	34
June 30, 2002	37
January 8, 2006	39
May 14, 2007	41

Learn more about the PoWs in Booth 2425 or at http://mathforum.org/problems_puzzles_landing.html

Pre-Algebra Scoring Rubric for Postal Rates

For each category, choose the level that *best describes* the student's work

	Novice	Apprentice	Practitioner	Expert
Problem Solving				
Interpretation	doesn't seem to understand the question	thinks that the question is about all of the dates isn't sure how to calculate percentage increase	understands how to calculate percentage increase understands that the question is only about those five dates attempts to answer the question	is at least a Practitioner in Strategy and has successfully answered the Extra
Strategy	does not have any ideas about how to solve the problem	does guess and check without being careful – might have gotten lucky calculates only some of the percentage increases and makes a conclusion without explanation	has a strategy that relies on skill, not luck calculates the percentage increase for each of the five dates and compares	understands that, with a fixed numerator, the larger the denominator, the smaller the percentage increase
Accuracy	has made many errors	makes a few errors that lead to an incorrect answer	makes no arithmetic mistakes that really matter	[not normally available for this category]
Communication				
Completeness	has written nothing that tells you how they found their answer	shows work without an explanation <i>or</i> explains everything without showing the numbers doesn't include enough information for another student to follow	attempts to explain all of the steps taken to solve the problem, which might include: <ul style="list-style-type: none"> • where any fractions came from • how fractions are changed to percents 	adds in useful extensions and further explanation of some of the ideas involved (for example, how fractions are changed to percents)
Clarity	explanation is very difficult to read and follow	another student wouldn't be able to follow their explanation entirely long and written in one paragraph lots of spelling errors/typos	explains all of the steps mentioned in such a way that another student would understand makes an effort to check their formatting, spelling, and typing (a few errors are fine)	formats things exceptionally clearly answer is very readable and appealing
Reflection	<i>The items in the columns to the right are considered reflective, and could be in the solution or the comment they leave after viewing our answer:</i> does nothing reflective	checks their answer (not the same as viewing our "answer check") reflects on the reasonableness of their answer does one reflective thing	connects the problem to prior knowledge or experience explains where they're stuck summarizes the process they used does two reflective things	comments on and explains the ease or difficulty of the problem revising their answer and improving anything does three or more reflective things or an great job with two