

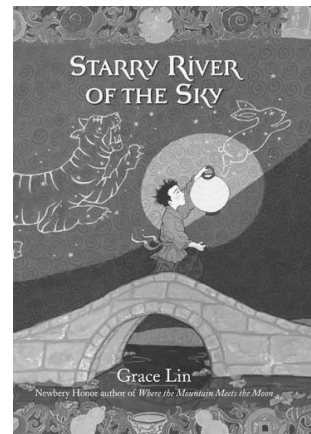


# HALF-MOON WELL

A Math Activity for the Book, *The Starry River of the Sky* by Grace Lin

## ABOUT THE BOOK

*The Starry River of the Sky* by Grace Lin (Little, Brown Books for Young Readers) is the story of Rendi, who runs away in anger from his wealthy Magistrate father and must support himself as the chore boy at a faraway village inn. The Village of Clear Sky is no ordinary village, though, for the Moon has disappeared, leaving only mysteries behind. Will the tasks given the chore boy cool Rendi's anger or only increase it? Will the stories at the Inn of Clear Sky unravel the mystery of the Moon, and will an angry chore boy learn to care?



## ABOUT THE AUTHOR

Grace Lin is the author and illustrator of picture books, early readers and middle grade novels. Grace's 2010 Newbery Honor book *Where the Mountain Meets the Moon* was chosen for the Today Show Kid's Book Club and was a NYT's Bestseller. *Ling & Ting*, Grace's first early reader, was honored with the Theodor Geisel Honor in 2011. An Astrid Lindgren Memorial Award nominee for the US, most of Grace's books are about the Asian-American experience because she believes, "Books erase bias, they make the uncommon everyday, and the mundane exotic. A book makes all cultures universal." More at [www.GraceLin.com](http://www.GraceLin.com).

## THE MATHEMATICS OF CHORE BOYS

Rendi begins his time as chore boy with hands "as soft as uncooked tofu." What does this mean? As the son of a wealthy Magistrate, Rendi never had to do the hard work that hardened his hands with exposure to the sun, new strength, or the calluses that come from using tools until Master Chao assigned him the hard work of the Inn of Clear Sky.

Some might say that math is also hard work or a chore, but others would tell you that math is an intriguing puzzle embedded in everything we do. When you open your mind to how long a chore takes, for example, a mundane task can become a satisfying play of numbers. Let's see if we can puzzle out how hard Rendi worked as a chore boy to lose those "tofu" hands.

Half-Moon Well Answers 1) 48 2) 72 min. 3) 82 min. 4) 69 min.  
Toad in a Hole Answers 1) 192 2) 384 min. or 6 hrs. 24 min.

### Half-Moon Well

(This math puzzle comes from pages 71-75 and 104-107)

Rendi is sent to fetch water every day at Half-Moon Well with two buckets on a carrying stick. A wall divides the well so that Rendi cannot fit his buckets into the well. Instead he must fill small gourds with water to fill his buckets. Rendi's two buckets are homemade, but let us say that they each hold 3 gallons of water. The gourd only holds 1 pint of water.



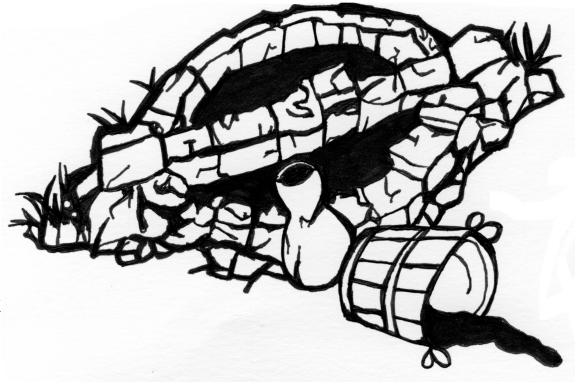


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### Half-Moon Well (cont.)

- 1) How many times does Rendi have to send the gourd down the well to fill his two buckets?
- 2) If it takes Rendi 1.5 minutes to drop the gourd into the well, pull it up, and fill the bucket, how long will it take Rendi to fill his two buckets?
- 3) If the walk to the well takes 4 minutes and the walk home takes 6 minutes (he is slower carrying all that water), how many minutes does the whole chore take Rendi?



(When Rendi lived with his wealthy father, water was brought to the house by servants. Can you see how much the mathematics of chores is changing Rendi's life and his soft hands?)

- 4) Later in the story, Mr. Shan breaks down the wall dividing the well. Now Rendi can drop each bucket directly into the well and pull it up full. If each bucket takes him 1.5 minutes to fill now, and the trip back and forth to the well takes the same amount of time, how much shorter is Rendi's chore because of Mr. Shan's action?

### Toad in the Hole

(This math puzzle comes from pages 49-56)

When Master Chao tells Rendi to fill the dried-up well in the Inn of Clear Sky's yard, he and Peiyi discover a toad is stuck at the bottom of the well. Peiyi thinks that by filling the well Rendi will bury the poor toad. Madame Chang assures her that the toad will be fine. In fact, with each shovelful of dirt Rendi adds to the well, the toad simply climbs on top of the dirt pile, rising as the level of the well rises. This free ride out of the hole for the toad, though, is a lot of work for Rendi!

- 1) If the well was 8 feet deep and each shovelful of dirt raised the well bottom by one half of an inch, how many shovels of dirt did it take to fill the well and rescue the toad?
- 2) If it took Rendi an average of 2 minutes to fill each shovel with dirt and dump it in the well, how many minutes did it take him to fill the well?  
How many hours and minutes?

Now the real puzzle is, why are Mr. Shan and Madame Chang so happy to see this toad? This is a question that cannot be solved by mathematics!

