Lesson 8-4

NAME Meghan DATE 5/16/17 TIME

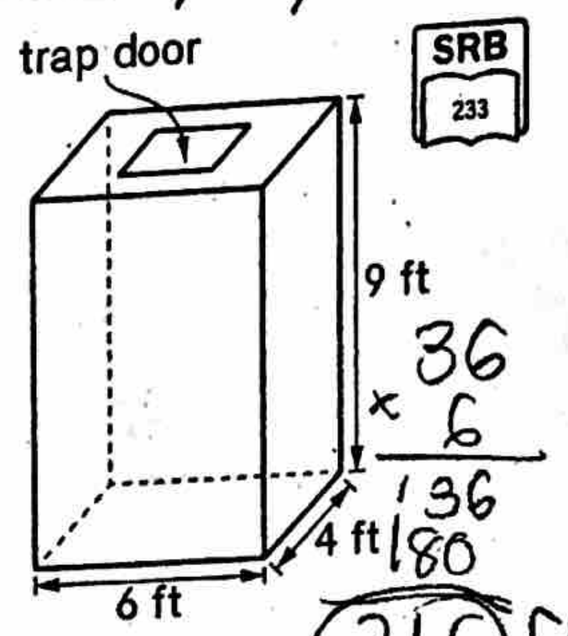
A Treasure Hunt

A fifth-grade class read an adventure story. In the story an explorer named Miriam traveled to South America in search of a lost treasure.

Traps had been set to guard the treasure. Miriam fell through a trap door into a 9-foot-high rectangular room that measured 4 feet wide by 6 feet long.

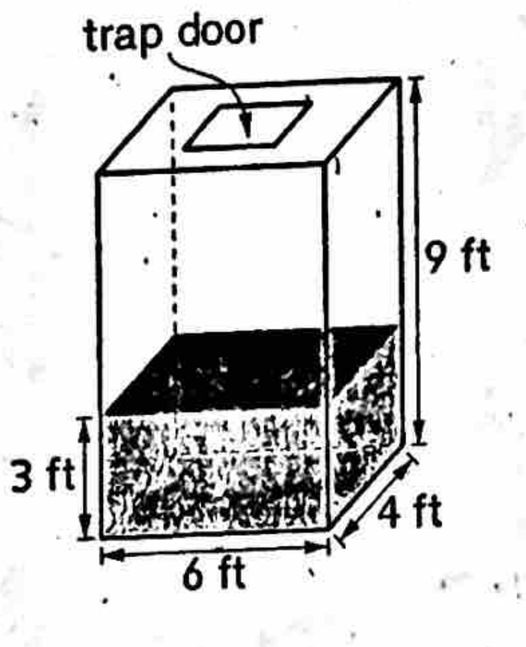
Suddenly, the room began to fill with water! It stopped when the water was 3 feet deep. Miriam sighed with relief, but her relief didn't last long.

The two 4-foot-wide walls of the room began to move, making the room smaller and causing the water level to rise. Every 10 minutes, the walls were 1 foot closer together.

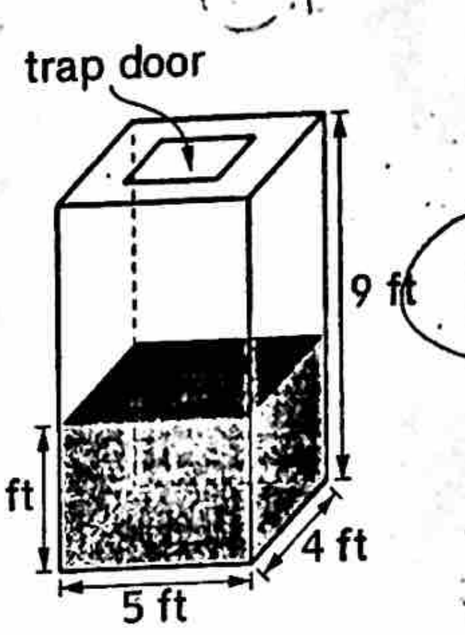


SRB 233

36 × 6 = 136 + 180 = 216 ft3



The room begins to fill with water.



180 ft3

The room after 10 minutes

① To the right is a picture of what the room looked like after 10 minutes, when the 4-foot-wide walls had moved 1 foot closer together.

What is the approximate height of the water? Show how you found your answer.

stays the same: $72 = 3 \times 4 \times 6$ (−1)

different ↓ stays the same

$72 = a \times (4 \times 5)$

$72 \div 20$

$20 \times 3 = 60$

$20 \times \frac{1}{5} = 4$

$20 \times \frac{1}{5} = 4$

$20 \times \frac{1}{5} = 4$

$72 = 72$

$3\frac{3}{5}$

20

15

$a = 3\frac{3}{5}$

We know that the volume of the water stays the same at 72 ft3. We know that the 4 stays the same, but 6 and 5 change. I subtracted 1 from you 5. Our equation is $5 \times 4 \times a = 72 = L \times W \times h = V$

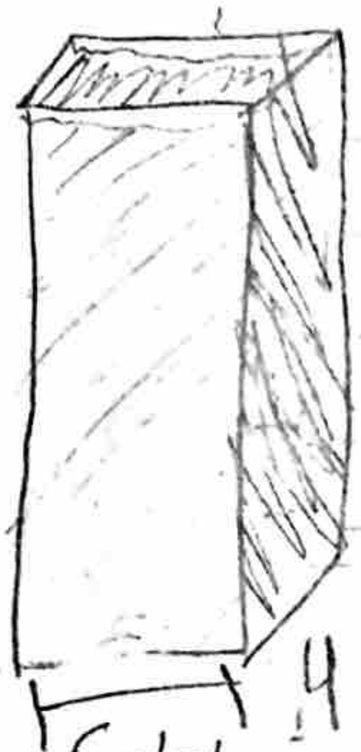
A Treasure Hunt (continued)

Lesson 8-4

NAME Meghan DATE TIME

② The only way to get out of the room is through the trap door in the ceiling. About how much time will pass before the water lifts Miriam to the trap door? Show your work. Explain how you used representations to help you solve the problem.

$a = 3 \frac{3}{5} = 3.6$



9) constant

$9 \times 4 = 36$

answer:
40 mins.

time	length		width × height		volume of water
10	5	×	36	=	180
20	4	×	36	=	144
30	3	×	36	=	108
40	2	×	36	=	72
50	1	×	36	=	36

→ It will take 40 minutes for the length to be at 2 feet and the water volume to be at 72 ft³

I knew that 4 (the length) and 9 (the height) are a constant. So, I multiplied them together and got 36. I knew that 5 subtracted 1 foot in width every ten minutes. So, I made a chart that showed 5 decreasing by 1 every row, that number multiplied by 36, what that equals, and how much time it took to get there. I stopped when the answer was at 72 (the amount of water in cubic feet) and saw that it