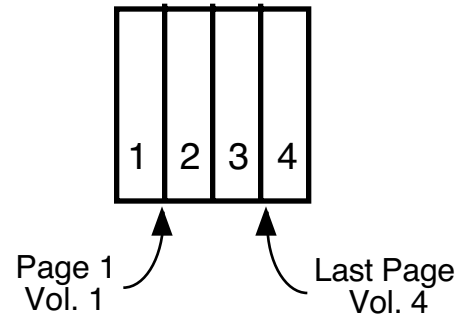


Answers to Problems in Reasoning 1

1. See Illustration. To get from page 1, volume 1 to the last page of volume 4 the bookworm through eats all of volumes 2 and 3, but only eats the covers of volumes 1 and 4. Thus, the distance is $\frac{1}{8} + 2\frac{1}{4} + 2\frac{1}{4} + \frac{1}{8}$, which is equal to $4\frac{3}{4}$ inches.



(Note: Even erudite bookworms find some of Shakespeare's works hard to digest.)

2. The match.
 3. $(x - x) = 0$. Thus, $(a - x)(b - x)(c - x)...(z - x) = 0$

4. Hint 1: The product of their ages is 36. Making a list, we see that there are eight possibilities, so we need another hint.

Product	Sum
$1 \cdot 1 \cdot 36$	38
$1 \cdot 2 \cdot 18$	21
$1 \cdot 3 \cdot 12$	16
$1 \cdot 4 \cdot 9$	14
$1 \cdot 6 \cdot 6$	13
$2 \cdot 2 \cdot 9$	13
$2 \cdot 3 \cdot 6$	11
$3 \cdot 3 \cdot 4$	10

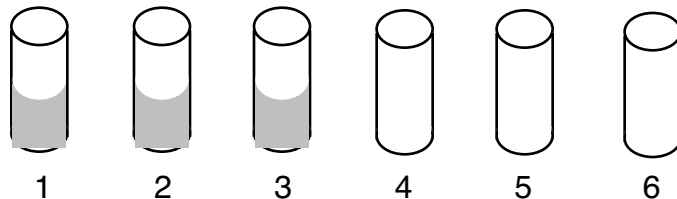
Hint 2: The sum of their ages is equal to your house number. We assume the woman knows her own house number. Why, then does she not know the ages? Because there are **two** combinations with a sum equal to her house number. Thus, her house number is 13 and we need another hint.

Hint 3: My youngest **one** is blond. Both combinations have twins (or at least children of the same age). The combination with a youngest **one** is 1, 6, 6.

5. If you read the question as stated here and give no hints or further explanation, some students will interpret this to mean the most sunshine. Others may interpret this as number of hours in a day, which, indeed, is what is intended. Thus, you may get answers like "All days have 24 hours. There is no longest day." But there is. It will be the last Sunday in October, when Daylight Savings time reverts to Standard Time. On that day you set the clock back an hour, giving you a 25 hour day.

6. The beggar was female.

7. Lift glass 2, pour contents into glass 5, return glass 2 to its original location.



8. 7 days. On the seventh day the captive must fill double the previous total. Double $\frac{1}{3}$. Thus, on the seventh day, the captive must fill the remaining two-thirds.
 9. 8 minutes. Each man smokes one cigarette in 8 minutes.
 10. Two rungs. The ship rises with the tide.
 11. There is no dirt in a hole.