



Math Olympiad and Problem Solving Programs  
F120 - Intermediate Problem Solving  
Problem Set 11.2 - Work Backwards

Name:

Date:

1.
2.
3. a)  b)
4. The answer key was incorrect. The answer should be \$15. However, the problem is somewhat ambiguous, so \$60 is accepted as well.
5.
6. To work backwards, we need to unspend the money he spent, and we need to take out the money he deposited. So we find that  $899 + 98 + 617 + 14 = 1628$  puts back the money he spent, and  $1628 - 385 = 1243$  takes out the money he put in. So he originally had .
7. Work backwards. Dr. Li ate 3 cookies, Mrs. Li and her neighbor each ate 2 cookies, so there were a total of 7 cookies. Half of the box was used in the lunch boxes, and half were eaten by the Li's and the neighbor. So there were originally  in the box.
8.
9.
10. So we will work backwards.
  - 1) There was 60 kg of water in the bucket.
  - 2) There was 180 kg more water in the bucket. So there was  $60 + 180 = 240$  kg of water in the bucket.
  - 3) Tony uses half of the water and leaves 240 kg, so since he used half of the water, there was  $240 \times 2 = 480$  kg before he washed his hands.
  - 4) Justin used half of it to wash his feet and then filled in 40 kg, so he divided by 2 and added 40. To find out how much there was, we will do the backwards operations in backwards order; so we will subtract forty and times by 2.  $480 - 40 = 440$ .  $440 \times 2 = 880$ .
  - 5) So the bucket holds 880 kg.Check: do the operations in the question in order to make sure it ends up right.
  - 1) Dylan fills up 880 kg of water.
  - 2) Justin uses half of it, so there is 440 left, and then fills in 40 kg, so there is 480 left.
  - 3) Tony uses half of it, so there is 240 left.
  - 4) Jack uses 180, so there is  $240 - 180 = 60$  left.
  - 5) Williams uses the last 60 kg, and the water is gone.So the bucket holds  of water.