

[Problem 8.1]

Continue 20 questions for anyone that didn't get to go last time.

[Problem 8.2]

Three men go to stay at a motel and the clerk charges them \$30.00 for the room. They split the cost ten dollars each. Later the manager tells the clerk that he overcharged the men and that the actual cost should have been \$25.00. He gives the clerk \$5.00 and tells him to give it to the men. But he decides to cheat them and pockets \$2.00. He then gives each man a dollar. Now each man has paid \$9.00 to stay in the room and $3 \times \$9.00 = \27.00 . The clerk pocketed \$2.00. $\$27.00 + \$2.00 = \$29.00$. So where is the other \$1.00?

[Problem 8.3]

Once upon a time a farmer went to a market and purchased a fox, a goose, and a bag of beans. On his way home, the farmer came to the bank of a river and rented a boat. But crossing the river by boat, the farmer could carry only himself and a single one of his purchases: the fox, the goose, or the bag of beans.

If left unattended together, the fox would eat the goose, or the goose would eat the beans.

The farmer's challenge was to carry himself and his purchases to the far bank of the river, leaving each purchase intact. How did he do it?

[Problem 8.4]

(i) If you multiply all the numbers between 1 and 10, how many zeros will be at the end?

(ii) How about if you multiply all the numbers between 1 and 100?

(iii) Between 1 and 1000?

[Problem 8.5]

Target number: use multiplication, division, addition, and subtraction on the given numbers to get to the target number. Use each given number exactly once.

(i) Target: 180 | Numbers: 1, 2, 3, 4, 5

(ii) Target: 3 | Numbers: 1, 2, 3, 4, 5

(iii) Target: 530 | Numbers: 17, 6, 6, 5, 5

ANSWER KEY

2. The clerk's cheat is included in the \$27, and the net transaction is only \$27. The owner gets \$25, the clerk gets \$2, and the men pay \$27.

3. Take the goose over first. Then come back and take the fox over, but take the goose with you on your final trip back to get the beans.

4. You just need to count the number of 5s in the factorization. This amounts to counting the number of multiples of 5, plus the number of multiples of 25, plus the number of multiples of 125, and so on.

(i) $10/5=2$ zeros

(ii) $100/5 + 100/25 = 20 + 4 = 24$ zeros

(iii) $1000/5 + 1000/25 + 1000/125 = 200 + 40 + 8 = 248$ zeros

5.

(i) $180 = (1+2)(3)(4)(5)$

(ii) $3 = (5-4)+(3-2)+1$

(iii) $530 = (17+(6)(6))(5+5)$