



Math Olympiad and Problem Solving Programs

F130 - Advanced Problem Solving

Problem Set 3.3 - Whole Numbers Solutions

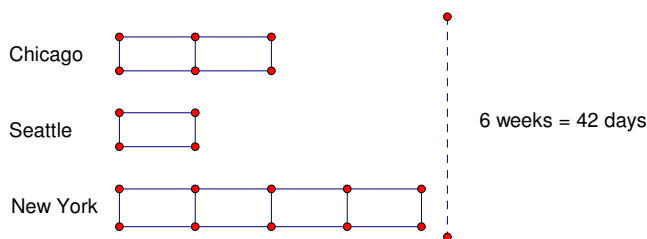
Name: _____

Date: _____

- The man has $2520 - 77 - 32 = 2411$ pretzels remaining. At \$1 each, he makes \$2,411. The profit is $2411 - 315 = \boxed{\$2096}$.
- The total cost of the items are $(27 \div 3) \times 2 + (60 \div 12) \times 5 = \43 . The change is $50 - 43 = \boxed{\$7}$.
- The amount of actual cost is $29 \times 4 + 17 \times 2 + 12 \times 3 = \186 . The difference is $200 - 186 = \boxed{\$14}$.
- We can simplify this problem by first calculate the savings per item: noses for $14 - 8 = 6$ each, mouths for $25 - 21 = 4$ each, and hats for $19 - 13 = 6$ each. Thus, the total saving is $4 \times 6 + 3 \times 4 + 2 \times 6 = \boxed{\$48}$.

Remark: When working on a problem, always try to keep things simple and work with smaller numbers.

- Mrs. Ross spent $40 \times 3 = \$120$ on yards. $40 \div 6 = 6R4$, which means she had enough yards to make 6 flags. The revenue from 6 flags is $6 \times 37 = \$222$. Thus, the profit is $222 - 120 = \boxed{\$102}$.
- Mr. Johnson spent $16 \times 14 = \$224$ on lollipops. 9 boxes contain $9 \times 50 = 450$ lollipops, which will make 45 packages of 10. The remaining 7 boxes contain 350 lollipops which makes 70 packages of 5. The total revenue is $45 \times 7 + 70 \times 3 = 525$. Thus, the profit is $525 - 224 = \boxed{\$301}$.
- We draw a model to represent the relationship between three roundtrips.



We use the round trip to Seattle as the smallest units. The 3 trips have a total of 7 units. Since 6 weeks contain 42 days, each unit is $42 \div 7 = 6$ days. The round trip to Chicago will then take 12 days, but a one-trip is $\boxed{6 \text{ days}}$.

- We set up a table to solve this problem by looking for the multiples of 6 and multiples of 7.

Multiples of 6s	6	12	18	24	30	36	42
$6x + 3$	9	15	21	27	33	39	$\boxed{45}$
Multiples of 7s	7	14	21	28	35	42	49
$7x - 4$	3	10	17	24	31	38	$\boxed{45}$

The first number appears in the same column is $\boxed{45}$.

Remark: You can also use a Guess-and-Check strategy. However, you may get a higher number such as 87, which is also a correct answer. Actually, 45 plus any multiples of 42 will work.



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9. The times taken to make 6 tables is the same as to make 42 chairs. Thus, $315 \div (42 + 21) =$.
10. If all 200 mirrors are delivered, the revenue is \$1,000. For the 9 mirrors broken or lost, the penalty is $33 \times 9 = \$297$. Thus, the money collected is $1000 - 297 =$.