



Problem of the Week

Problem B and Solution

Flowers for Sarah

Problem

Sarah has constructed 8 new garden beds in a sunny location and is looking to plant a flower garden. Seed packets cost \$2.69 per flower variety, and she must pay a \$9.00 flat rate shipping fee for her order. She would like to plant quite a few different varieties, but not spend more than \$53.00.

- Write an inequality which states Sarah's problem mathematically, using the given costs, the number of varieties she buys, and her available funds.
- What are all possibilities for the number of seed packets Sarah can purchase?
- If Sarah purchases the maximum number of seed packets that she can, and plants the same number of seed packets in each garden bed, then how many packets of seeds does she plant in each garden bed?
- In the end, Sarah buys as many seed packets as she can, purchasing in total four varieties: zinnias, salvia, daisies, and cosmos. She purchases three times as many packets of zinnias as salvia, and equal numbers of packets of daisies and cosmos. If she buys two seed packets of salvia, how many did she buy of each of the other three flower types?

Solution

- Let x represent the number of seed packets Sarah purchases. Then the total cost of her purchase will be $\$2.69 \times x + \9.00 . Since this must be no greater than \$53.00, an appropriate inequality is $\$2.69 \times x + \$9.00 \leq \$53.00$.
- The most Sarah could purchase would occur if $\$2.69 \times x + \$9.00 = \$53.00$. Solving for x gives $2.69 \times x = 53 - 9$, or $x = \frac{44}{2.69} \approx 16.36$. Thus, she can buy at most 16 seed packets. That is, she could purchase any number from 0 to 16 packets.
- If she maximizes her seed purchase, then she will buy 16 packets of seeds. So she will plant $16 \div 8 = 2$ packets of seeds in each of the eight garden beds.
- Since she bought 2 packets of salvia, she bought $3 \times 2 = 6$ packets of zinnias. This leaves $16 - 2 - 6 = 8$ packets to be divided evenly between daisies and cosmos, so she bought $8 \div 2 = 4$ packets of each of those.