Linear Equations and Constraints

1. Jerry's planting a garden. He wants it to have a desert theme, so he's only planting cacti and agaves. He wants a total of 23 plants in his garden. If he got kind of cactus crazy and planted 19 cacti, how many agaves can he plant?

2. Rachel's father's a bit of a control freak when it comes to chocolate, so he made a rule that she can only eat exactly 84 individual pieces of chocolate per week. She only eats StickBars, which come in packs of two, and ChocoLattices, which come in packs of eight. If she already ate eight packs of ChocoLattices this week, how many packs of StickBars can she eat?

3. Sandra's buying new tennis shoes and socks. She's really into having as little variety as possible in her wardrobe, so she's only buying one kind of tennis shoes, which cost $75 per pair, and one kind of socks, which cost $10 per pair. If she wants to spend exactly $250, what's an equation that represents how many pairs of tennis shoes and socks she can buy? Is it possible for Sandra to buy a single pair of tennis shoes and seventeen pairs of socks?

4. If Sandra bought two pairs of tennis shoes, how many pairs of socks can she buy?

5. George is worried that he feels a cold coming on, so he wants to stock up on tissue papers. His favorite brands are SneezeMax, which come in boxes of 160, and Achoo, which come in boxes of 120. If he wants a total of exactly 1640 sheets of tissue paper, what's an equation that models this situation? If he's already bought five boxes of SneezeMax, how many boxes of Achoo can he buy?

6. You and your friends want to order pizza for a party you are throwing. You know that you need exactly 180 pieces. A large pizza has sixteen slices and costs $10, a medium has twelve and costs $9, and a small has eight and costs $8. How many of each type of pizza do you buy if you want to have exactly 180 pieces, and you are trying to spend the least amount of money possible?

7. Anna is practicing rolling a ball at uniform speeds, for reasons that are unclear even to her. If she's standing seven meters away from a wall, and she rolls the ball away from the wall at a speed of five meters per second, what's an equation that represents the distance of the ball from the wall at a given moment in time?

8. If the ball is 32 meters from the wall, how long ago did Anna start rolling the ball?

9. Last spring when it started to get warm, Tom joyously burned all of his winter clothing, so now he has to buy some new stuff. He wants to buy hats that cost $25 each, gloves that cost $30 per pair, and boots that cost $85 per pair. If he wants to spend exactly $250, what's an equation that represents how many of each article of clothing he can buy?

10. Can Tom buy one pair of boots, three hats, and three pairs of gloves and stick to his spending limit?
