Solving Problems with Systems of Equations

Let's solve some gnarly problems.

16.1 Are We There Yet?

A car is driving toward home at 0.5 miles per minute. If the car is 4 miles from home at $t = 0$, which of these expressions can represent the distance that the car has left to drive?

- $0.5t$
- $4 + 0.5t$
- $4 - 0.5t$
- $4 \cdot (0.5t)$

16.2 Cycling, Fundraising, Working, and ___?

Solve each problem. Explain or show your reasoning.

1. Two friends live 7 miles apart. One Saturday, the two friends set out on their bikes at 8 a.m. and started riding toward each other. One rides at 0.2 miles per minute, and the other rides at 0.15 miles per minute. At what time will the two friends meet?

2. Students are selling school spirit gear for a fundraiser. Bracelets with the school mascot on them cost $1 each, and shirts with the school crest cost $10 each. They sold 100 items and made $307. How many bracelets did they sell?

3. Jada earns $7 per hour mowing her neighbors' lawns. Andre gets paid $5 per hour for the first hour of babysitting and $8 per hour for any additional hours he babysits. What is the number of hours they both can work so that they get paid the same amount?

4. Pause here so your teacher can review your work. Then, invent another problem that is like one of these, but with different numbers. Solve your problem.

5. Create a visual display that includes:
   - The new problem you wrote, without the solution.
   - Enough work space for someone to show a solution.
6. Trade your display with another group, and solve each other's new problem. Make sure that you explain your solution carefully. Be prepared to share this solution with the class.
7. When the group who got the problem that you invented shares their solution, check that their answer is correct.

Are you ready for more?

On a different Saturday, two friends set out on bikes at 8 a.m. and met up at 8:30 a.m. (The same two friends who live 7 miles apart.) If one was riding at 10 miles per hour, how fast was the other riding?