Lesson 1.3 Notes/Example

Problem 1  How Many DVDs Do I Have?

Sometimes, you are asked to determine the value of unknown quantities using only information you have for a quantity. For example, inventory managers can determine how much product was sold and how much product to order using algebraic equations.

Five friends have a certain number of DVDs.

- Dan has the fewest.
- Donna has 7 more than Dan.
- Betty has twice as many as Donna.
- Jerry has 3 times as many as Dan.
- Kenesha has 6 less than Donna.

1. Define a variable for the number of DVDs that Dan has.
   Let \( x \) equal the number of DVDs that Dan has.

2. Use your defined variable to write algebraic expressions to represent the number of DVDs each person has.
   a. DVDs that Donna owns: \( x + 7 \)
   b. DVDs that Betty owns: \( 2(x + 7) \)
   c. DVDs that Jerry owns: \( 3x \)
   d. DVDs that Kenesha owns: \( x + 1 \)

3. If the friends have a total of 182 DVDs altogether, then how many does each person have? Make sure to check your work.
   \[ x + (x + 7) + 2(x + 7) + 3x + (x + 1) = 182 \]
   \[ 8x + 22 = 182 \]
   \[ 8x = 160 \]
   \[ x = 20 \]

   Check:
   \[ (20) + (20 + 7) + 2((20 + 7) + 3(20)) + (20 + 1) = 182 \]
   \[ 47 + 54 + 60 + 20 + 1 = 182 \]

   Now use \( x = 20 \) and plug into other expressions to solve:
   a. DVDs that Dan owns: \( 20 \)
   b. DVDs that Donna owns: \( x + 7 = 20 + 7 = 27 \)
   c. DVDs that Betty owns: \( 2(x + 7) = 2(20 + 7) = 54 \)
   d. DVDs that Jerry owns: \( 3x = 3(20) = 60 \)
   e. DVDs that Kenesha owns: \( x + 1 = 20 + 1 = 21 \)