

**EXAMPLE 5****TAKS REASONING: Multi-Step Problem**

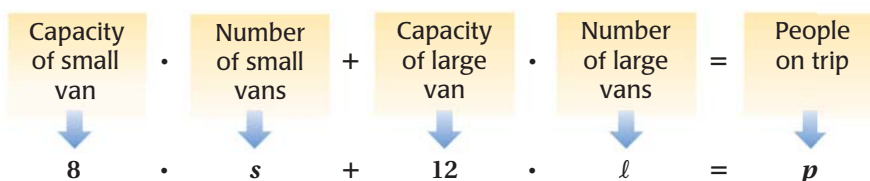
LIBRARY Your class is taking a trip to the public library. You can travel in small and large vans. A small van holds 8 people and a large van holds 12 people. Your class could fill 15 small vans and 2 large vans.



- Write an equation in standard form that models the possible combinations of small vans and large vans that your class could fill.
- Graph the equation from part (a).
- List several possible combinations.

Solution

- Write a verbal model. Then write an equation.



Because your class could fill 15 small vans and 2 large vans, use (15, 2) as the s - and l -values to substitute in the equation $8s + 12l = p$ to find the value of p .

$$8(15) + 12(2) = p \quad \text{Substitute 15 for } s \text{ and 2 for } l.$$

$$144 = p \quad \text{Simplify.}$$

Substitute 144 for p in the equation $8s + 12l = p$.

- The equation $8s + 12l = 144$ models the possible combinations.

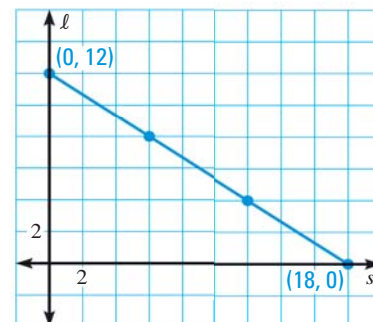
- Find the intercepts of the graph.

Substitute 0 for s . Substitute 0 for l .

$$8(0) + 12l = 144 \quad 8s + 12(0) = 144$$

$$l = 12 \quad s = 18$$

Plot the points (0, 12) and (18, 0). Connect them with a line segment. For this problem only nonnegative whole-number values of s and l make sense.



- The graph passes through (0, 12), (6, 8), (12, 4), and (18, 0). So, four possible combinations are 0 small and 12 large, 6 small and 8 large, 12 small and 4 large, 8 small and 0 large.

LISTING COMBINATIONS

Other combinations of small and large vans are possible. Another way to find possible combinations is by substituting values for s or l in the equation.

**GUIDED PRACTICE for Example 5**

- WHAT IF?** In Example 5, suppose that 8 students decide not to go on the class trip. Write an equation that models the possible combinations of small and large vans that your class could fill. List several possible combinations.