Remeber problem solving in Chapter 1?

Well, today we are going to be using the same model to set up problems.

Steps for Solving Problems with Mathematical Models

Step 1: Identify what you are looking for.

Step 2: Give Names to the Unknowns.

Step 3: Translate the Problem into the Language of Mathematics.

Step 4: Solve the Equation(s) Found in Step 3.

Step 5: Check the Reasonableness of your Answer.

Step 6: Answer the Question (in a complete sentence).

Ex 1: *On a 12-hour trip from Ohio to the Outer Banks, the Smith family stopped twice for snacks. In West Virginia they ordered 3 large drinks and 4 sub sandwiches for $22.25. A few hours later they stopped again in North Carolina and ordered 2 large drinks and 3 sub sandwiches for $16.25. How much did each large drink and each sub cost? (Assume that the cost of each is the same in both locations.)*

Step 1: Identify

We want to know the cost of each hot dog and the cost of each soda.

Step 2: Name

Let's have ***h*** represent each hot dog, and ***s*** represent the cost of each Sprite.

Ex 1: Remember: *In West Virginia they ordered 3 large drinks and 4 sub sandwiches for $22.25. In North Carolina, they ordered 2 large drinks and 3 sub sandwiches for $16.25.*

Step 3: Translate

So now, we need a mathematical model.

Ex 1: Remember: In West Virginia they ordered 3 large drinks and 4 sub sandwiches for $22.25. In North Carolina, they ordered 2 large drinks and 3 sub sandwiches for $16.25.

Step 4 : Solve

Ex 1: Remember: In West Virginia they ordered 3 large drinks and 4 sub sandwiches for $22.25. In North Carolina, they ordered 2 large drinks and 3 sub sandwiches for $16.25.

Step 5: Check

Step 6: Answer the Question

Ex 2: A recently retired couple needs $12,000 per year to supplement their Social Security. They have $150,000 to invest. They have decided on two investments: Bonds yielding 10%, and a CD yielding 5%. How much should be invested in each to realize exactly $12,000?

Step 1: Identify

Step 2: Name

Ex 2: Remember: They have $150,000 to invest. Bonds yielding 10%, and a CD yielding 5%. How much should be invested in each to realize exactly $12,000?

Step 3: Translate

So now, we need a mathematical model.

Step 4 : Solve

Ex 2: Remember: They have $150,000 to invest. Bonds yielding 10%, and a CD yielding 5%. How much should be invested in each to realize exactly $12,000?

Step 5: Check

Step 6: Answer the Question

Ex 3: A coffee distributor is blending a new coffee that will cost $3.90 per pound. It will consist of a blend of $3.00-per-pound coffee and $6.00-per-pound coffee. What amounts of each type of coffee should be mixed to make 10 pounds of the blend?

Step 1: Identify

Step 2: Name

Ex 3: Remember: *New coffee that will cost $3.90 per pound. It will consist of a blend of $3.00-per-pound coffee and $6.00-per-pound coffee. What amounts of each type of coffee should be mixed to make 10 pounds of the blend?*

Step 3: Translate

So now, we need a mathematical model.

Ex 3: Remember: New coffee that will cost $3.90 per pound. It will consist of a blend of $3.00-per-pound coffee and $6.00-per-pound coffee. What amounts of each type of coffee should be mixed to make 10 pounds of the blend?

Step 4 : Solve

Ex 3: Remember: New coffee that will cost $3.90 per pound. It will consist of a blend of $3.00-per-pound coffee and $6.00-per-pound coffee. What amounts of each type of coffee should be mixed to make 10 pounds of the blend?

Step 5: Check

Step 6: Answer the Question

Ex 4: With a tail wind, a small airplane can fly 600 miles in 3 hours. Against the same wind, the plane can fly the same distance in 4 hours. Find the average wind speed, and the average airspeed of the plane.

Remember $d = r\,(\,t\,)$

Step 1: Identify

Step 2: Name

Ex 4: With a tail wind, a small airplane can fly 600 miles in 3 hours. Against the same wind, the plane can fly the same distance in 4 hours. Find the average wind speed, and the average airspeed of the plane.

Remember $d = r\,(\,t\,)$

Step 3: Translate

Step 4 : Solve

Ex 4: With a tail wind, a small airplane can fly 600 miles in 3 hours. Against the same wind, the plane can fly the same distance in 4 hours. Find the average wind speed, and the average airspeed of the plane.

Remember $d = r(t)$

Step 5: Check

Step 6: Answer the Question

Ex 5: Business is motivated by profit. A company's profit is the difference between the revenues and the cost. It is key that a company understand the number of units of their product they must manyfacture and sell in order to be profitable.

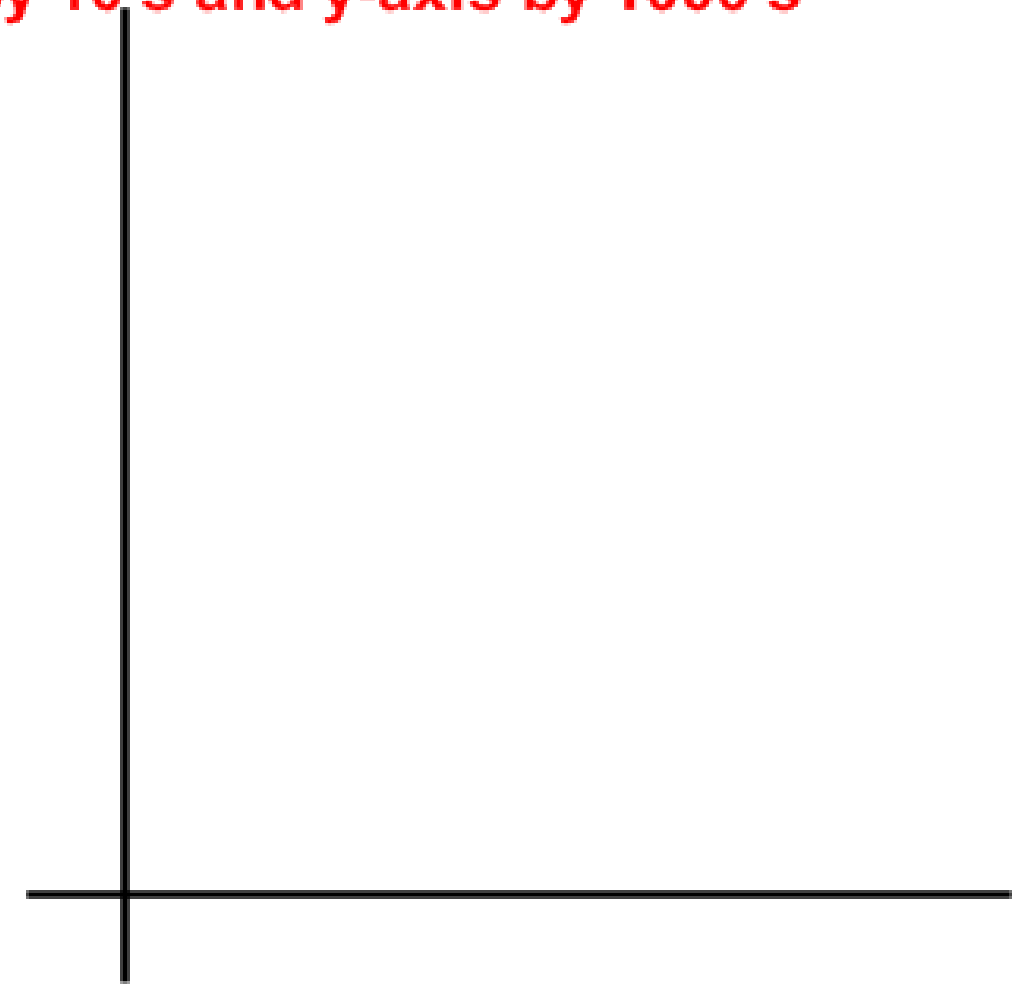
A company sells its basic wood stove for $475. The variable costs of manufacturing the stove are $175 per stove. The fixed monthly costs are $7500.

a.) Write revenue, R, as a function of the number of wood stoves sold, x.

b.) Write cost, C, as a function of the number of stoves manufactured, x.

Ex 5: Remember: A company sells its basic wood stove for $475. The variable costs of manufacturing the stove are $175 per stove. The fixed monthly costs are $7500.

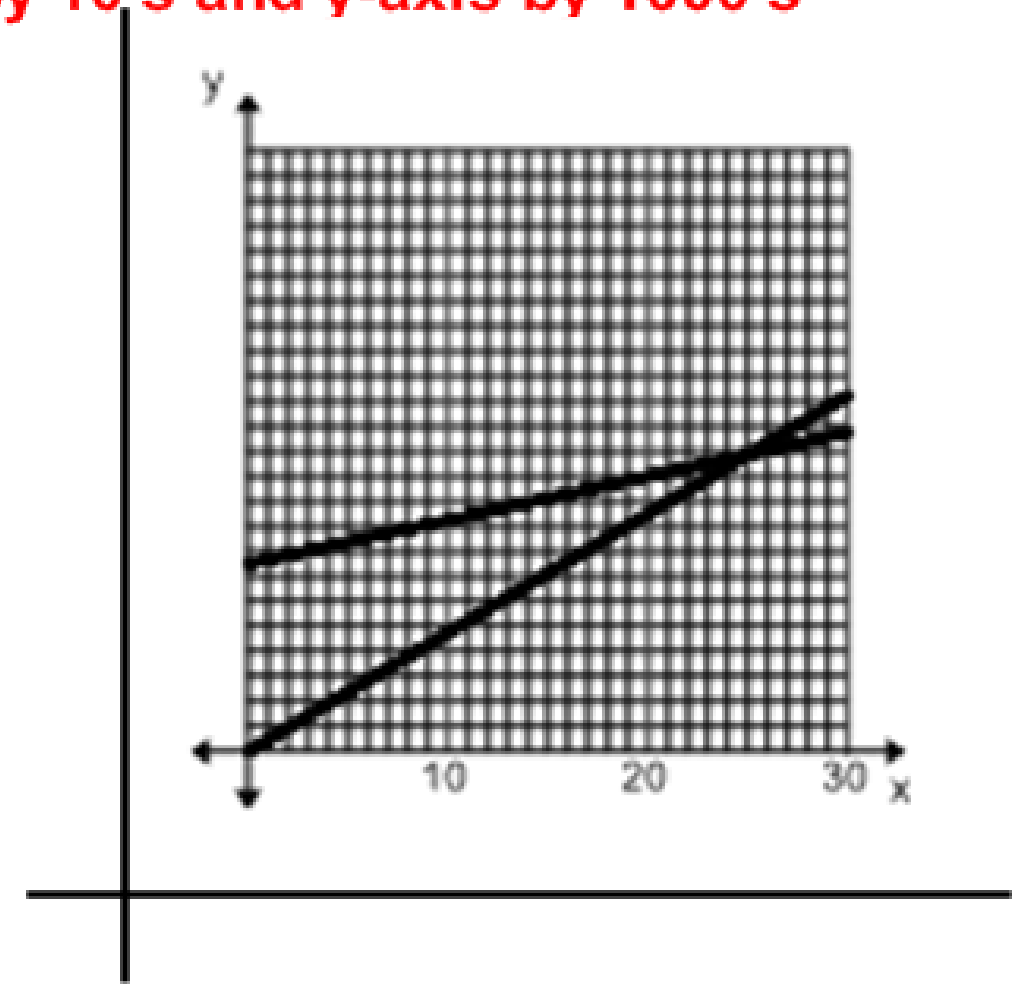
c.) Graph the revenue function and the cost function on the same Cartesian plane. x-axis by 10's and y-axis by 1000's



Ex 5: Remember: A company sells its basic wood stove for $475. The variable costs of manufacturing the stove are $175 per stove. The fixed monthly costs are $7500.

c.) Graph the revenue function and the cost function on the same Cartesian plane. x-axis by 10's and y-axis by 1000's

(about (25, 11,875) - so 25 wood stoves made, $11,875 revenue)



Ex 5: Remember: A company sells its basic wood stove for $475. The variable costs of manufacturing the stove are $175 per stove. The fixed monthly costs are $7500.

d.) The break-even point is the point where revenue equals cost. Tell the number of wood stoves made and the revenue at this point.

For more examples,
go to pgs. 271-280.

Homework:

Pg 280-284: # 3, 7, 9, 11, 15, 23, 25, 29, 31, 39

AND

Pg 330-331: # 1, 5, 7, 11, 14, 19

Lesson 4.2: Problem Solving with Systems of Equations