

1.3B Problem Solving Review

A. Strategy

1. Rewrite the problem—maybe with picture—leaving out useless info.
2. Let x = what you don't know
Then write down as many things as you know about x .
3. Use list to convert problem statement into an equation
4. Solve the equation and check it.
5. Actually answer original question.

B. Examples

Example 1: (^{Similar to} Problem #33) The bus fare in a city is \$1.25. People who use the bus have the option of purchasing a monthly coupon book for \$21.00. With the coupon book, the fare is reduced to \$.50. How many times in a month must the bus be used so that the total monthly cost without the coupon book is the same as the total monthly cost with the coupon book?

Solution

1. Bus Fare = \$1.25 [no coupon book]

Coupon Book = \$21.00 [per month]

Bus fare w/ coupon book = \$.50

2. Let x = # of times riding the bus

Cost (no coupon): $\$1.25x$

Cost (coupon): $.50x + 21.00$

3. Want $1.25x = .50x + 21.00$

4. $.75x = 21$

$$x = \frac{21}{.75} = 21 \cdot \frac{4}{3} = 28$$

Check: $1.25(28) \stackrel{?}{=} .50(28) + 21$

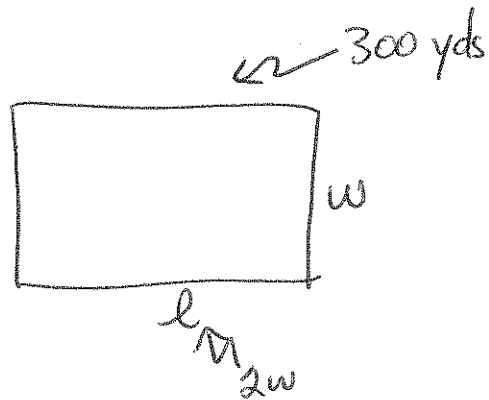
Ans: 28 times

Unless you ride almost every day, you are wasting your money with the coupon book.

Example 2: (Problem #49) A rectangular soccer field is twice as long as it is wide. If the perimeter of the soccer field is 300 yards, what are its dimensions?

Solution

1. Picture



2. Let $x = \text{width}$

Then $2x = \text{length}$

Then Perimeter $= x + 2x + x + 2x = 6x$

3. $P = 300 \Rightarrow 6x = 300$

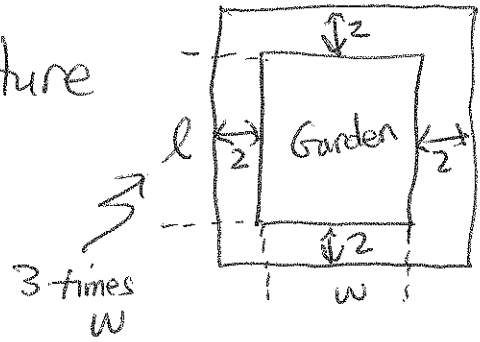
4. $x = 50$ NOT DONE!

Ans: 50 yd x 100 yd

Example 3: A gardener has 96 feet of fencing to enclose a rectangular garden and a 2-foot wide surrounding border. If the length of the garden is 3 times its width, what are the dimensions?

Solution

1. 96 ft of fencing ... Picture



2. Let x = width of garden

Then $3x$ = length of garden

Then $x+4$ = width of border

Then $3x+4$ = length of border

Then perimeter of border = $(x+4) + (3x+4) + (x+4) + (3x+4) = 8x+16$

3. Then $P=96 \Rightarrow 8x+16=96$

4. $8x=80 \Rightarrow x=10$ NOT DONE

Ans:

width: 10 ft

length: 30 ft

i.e. 10' x 30'

Also: Review Mixture Problems from MTH1825 Section 2.5