# Some Word problems

December 5, 2008

## 1 Motion problems

1. At 12 pm, two buses leave a town heading in *opposite directions*. One bus is traveling at 50 mph and the other at 60 mph.

   (a) How far has each bus traveled when the time is 3 pm? How far apart are the two buses?

   (b) How far apart they are when the time is 4:30 pm?

   (c) What time will be when they are 550 miles apart?

2. At 1:30 pm, two cars leave a town heading in *the same direction*. One car is traveling at 54 mph and the other at 66 mph.

   (a) How far has each car traveled when the time is 3 pm? How far apart are the two buses?

   (b) What time will be when the two cars are 60 miles apart?

3. Towns $A$ and $B$ are 460 miles apart. At 1 am a car leaves town $A$ heading towards town $B$ traveling at 55 mph and another car leaves town $B$ heading towards town $A$ at 60 mph.

   (a) How far has each car traveled when the time is 2 am? How far apart are the two cars?

   (b) What time will the two cars meet?

4. A jet flies east with the wind and covers a distance of $1,800$ miles in 3 hours. The speed of the wind was 60 miles per hour.

   (a) What was the speed of the jet in still air?

   (b) Assuming that the wind maintains the same velocity how long it will take the jet to make the return trip?

5. A jet flies north with the wind and covers a distance of $2,000$ miles in 4 hours.

   (a) Let $x$ be the speed of the jet in still air and $y$ be the speed of the wind. Write an equation relating $x$ and $y$.

   (b) Solve the equation you wrote above for $y$.

   (c) If the return trip took 5 hours find the speed of the jet in still air and the speed of the air.

# 2 Geometric problems

1. Consider the following shape:

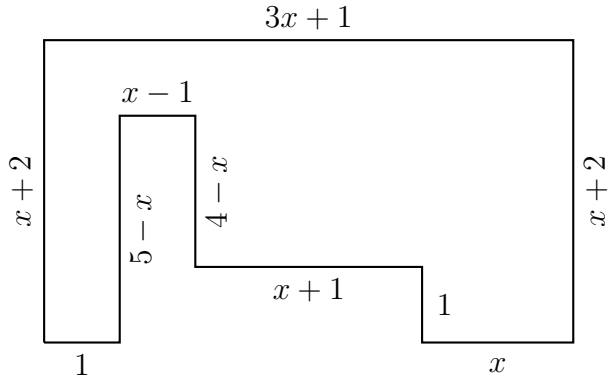


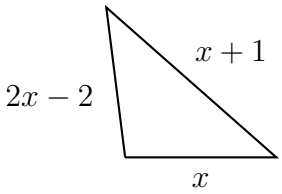

Figure 1: The shape

(a) Find an algebraic expression that represents the *perimeter* of the shape. Simplify the expression as much as possible

(b) Find the perimeter if $x = 3\,\text{cm}$.

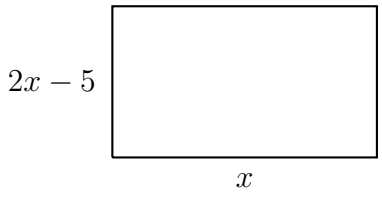
(c) Find $x$ if the perimeter of the shape is $28\,\text{cm}$.

2. Find the lengths of the sides of the following triangle if its perimeter is 7 cm.




3. One side of a triangle is 2 units more than the smallest side and the third side is one unit less than twice the smallest side. The perimeter of the triangle is 21 units. Find the lengths of all the sides of the triangle.

4. The perimeter of the following rectangle is 11 inches. Find its dimensions.




5. The width of a rectangle is 5 inches more than three times its width. If the perimeter of the rectangle is 22 inches find its length and its width.