1. **In a given amount of time, Jamie drove twice as far as Rhonda. Altogether they drove 90 miles. Find the number of miles driven by each.**

Step 1: What are we trying to find?

The number of miles driven by Jamie and by Rhonda.

Step 2: Assign a variable.

Since we are looking for two numbers here, we need to choose which one we will assign a [variable](javascript:def('/Glossary/glossaryterm.aspx?word=Variable',%20500,%20500);) to. The number of miles driven by either Jamie or Rhonda will work. We need to just choose one and move to Step 3. Let’s assign a [variable](javascript:def('/Glossary/glossaryterm.aspx?word=Variable',%20500,%20500);) to represent the number of miles driving by Rhonda   
  
Let’s call it *R*.

Step 3: Write down what the [variable](javascript:def('/Glossary/glossaryterm.aspx?word=Variable',%20500,%20500);) represents.

Let *R* = the number of miles driven by Rhonda

Step 4: Write an equation.

We know that Jamie drove twice as far a Rhonda. As with Example 4, let’s think about this in terms of numbers before jumping into an equation. If Rhonda drives 10 miles, then Jamie will drive twice as far which would be 20. So whatever amount Rhonda drives, Jamie’s amount will be two times that number. We have already decided that the number of miles driven by Rhonda is *R*, so the number of miles driven by Jamie is 2*R*. Together they drove a total of 90 miles. So we have (Rhonda) + (Jamie) = 90, or http://algebralab.org/img/41f366dd-31a2-4f2b-863b-cf393abf7300.gif

Step 5: Solve the equation.

http://algebralab.org/img/78e46a7c-9c1c-410a-983d-dee74bda5205.gif

Step 6: Answer the question in the problem

The problem asks us to find out how far Rhonda and Jamie drove. The [solution](javascript:def('/Glossary/glossaryterm.aspx?word=Solution',%20500,%20500);) to the [equation](javascript:def('/Glossary/glossaryterm.aspx?word=Equation',%20500,%20500);) tells us *R* = 30, which means Rhonda drove 30 miles. Now we have to find out how far Jamie drove. She drove twice as far as Rhonda, so the distance would be 20 miles.

Step 7: Check the answer.

The answer makes sense and checks in our [equation](javascript:def('/Glossary/glossaryterm.aspx?word=Equation',%20500,%20500);) from Step 4.   
  
http://algebralab.org/img/6a36367b-d3c4-4862-adce-d65835c96657.gif

1. **Karen works for $6 an hour. A total of 25% of her salary is deducted for taxes and insurance. She is trying to save $450 for a new car stereo and speakers. How many hours must she work to take home $450 if she saves all of her earnings?**

Step 1: What are we trying to find?

The number of hours Karen needs to work.

Step 2: Assign a [variable](javascript:def('/Glossary/glossaryterm.aspx?word=Variable',%20500,%20500);) for the number of hours.

Let’s call it *h*.

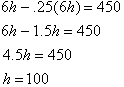
Step 3: Write down what the [variable](javascript:def('/Glossary/glossaryterm.aspx?word=Variable',%20500,%20500);) represents.

Let *h* = the number of hours Karen needs to work

Step 4: Write an equation.

However many hours Karen works, we multiply that number by 6 to find out how much she earns. For example, if she worked, 10 hours, she would make $60 before taxes and insurance. So her salary before taxes and insurance will be 6*h*. From that amount, we have to subtract the amount taken out for taxes and insurance. 25% of her salary is taken away. We need to write 25% as a decimal which gives 0.25. But we have to take 25% OF her salary or 25% of 6*h*. Karen’s goal is $450. We can now write an equation.   
  
(Salary) - 25%(Salary) = 450   
  
http://algebralab.org/img/fb39a73f-894a-4d62-a96e-05f48421d0e2.gif  
  
You may wonder why we did not use a dollar sign in the equation. Some students find the extra symbols distracting. It will be necessary to include dollars as part of any answer we may give involving money in this problem.

Step 5: Solve the equation.



Step 6: Answer the question in the problem

The problem asks us to find how many hours Karen needs to work. We decided that h would be the number, so we have *h* = 100. Karen needs to work 100 hours to reach her goal of $450.

Step 7: Check the answer.

The answer makes sense and checks in our [equation](javascript:def('/Glossary/glossaryterm.aspx?word=Equation',%20500,%20500);) from Step 4.   
  
http://algebralab.org/img/7f56eab0-18be-45ad-9012-dac56499c30f.gif

1. **The** [**length**](javascript:def('/Glossary/glossaryterm.aspx?word=Length',%20500,%20500);) **of a rectangular map is 15 inches and the** [**perimeter**](javascript:def('/Glossary/glossaryterm.aspx?word=Perimeter',%20500,%20500);) **is 50 inches. Find the width.**

Step 1: What are we trying to find?

The width of a rectangle.

Step 2: Assign a [variable](javascript:def('/Glossary/glossaryterm.aspx?word=Variable',%20500,%20500);) for the width.

Let’s call it *w*.

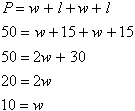
Step 3: Write down what the [variable](javascript:def('/Glossary/glossaryterm.aspx?word=Variable',%20500,%20500);) represents.

Let *w* = the width of a [rectangle](javascript:def('/Glossary/glossaryterm.aspx?word=Rectangle',%20500,%20500);)

Step 4: Write an equation.

We know the [length](javascript:def('/Glossary/glossaryterm.aspx?word=Length',%20500,%20500);) is 15 inches. We also know the [perimeter](javascript:def('/Glossary/glossaryterm.aspx?word=Perimeter',%20500,%20500);) is 50 inches. [Perimeter](javascript:def('/Glossary/glossaryterm.aspx?word=Perimeter',%20500,%20500);) is the distance all the way around a figure. So to go all the way around a rectangle, you have   
  
[Perimeter](javascript:def('/Glossary/glossaryterm.aspx?word=Perimeter',%20500,%20500);) = width + [length](javascript:def('/Glossary/glossaryterm.aspx?word=Length',%20500,%20500);) + width + length.   
  
Since [length](javascript:def('/Glossary/glossaryterm.aspx?word=Length',%20500,%20500);) is 15 inches, width is *w*, and [perimeter](javascript:def('/Glossary/glossaryterm.aspx?word=Perimeter',%20500,%20500);) is 50, we get   
  
http://algebralab.org/img/8d41a133-93bd-43df-b8cd-b1312e707582.gif

Step 5: Solve the equation.



Step 6: Answer the question in the problem.

The problem asks us to find the width of a rectangle. We decided that w would represent width, so we have *w* = 10. The width of the [rectangle](javascript:def('/Glossary/glossaryterm.aspx?word=Rectangle',%20500,%20500);) is 10 inches. Don’t forget your units.

Step 7: Check the answer.

The answer makes sense and checks in our [equation](javascript:def('/Glossary/glossaryterm.aspx?word=Equation',%20500,%20500);) from Step 4.   
  
http://algebralab.org/img/cfe1aff4-686d-4876-8b1d-892d69290bfe.gifinches

1. **The** [**circumference**](javascript:def('/Glossary/glossaryterm.aspx?word=Circumference',%20500,%20500);) **of a circular clock** [**face**](javascript:def('/Glossary/glossaryterm.aspx?word=Face%20',%20500,%20500);) **is 13.12 centimeters more than three times the radius. Find the** [**radius**](javascript:def('/Glossary/glossaryterm.aspx?word=Radius',%20500,%20500);) **of the face.**

Step 1: What are we trying to find?

The [radius](javascript:def('/Glossary/glossaryterm.aspx?word=Radius',%20500,%20500);) of the [face](javascript:def('/Glossary/glossaryterm.aspx?word=Face%20',%20500,%20500);) of a circular clock.

Step 2: Assign a [variable](javascript:def('/Glossary/glossaryterm.aspx?word=Variable',%20500,%20500);) for the radius.

Let’s call it *r*.

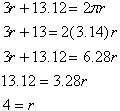
Step 3: Write down what the [variable](javascript:def('/Glossary/glossaryterm.aspx?word=Variable',%20500,%20500);) represents.

Let *r* = the [radius](javascript:def('/Glossary/glossaryterm.aspx?word=Radius',%20500,%20500);) of the clock [face](javascript:def('/Glossary/glossaryterm.aspx?word=Face%20',%20500,%20500);)

Step 4: Write an equation.

First we need to know a formula that will relate [circumference](javascript:def('/Glossary/glossaryterm.aspx?word=Circumference',%20500,%20500);) and [radius](javascript:def('/Glossary/glossaryterm.aspx?word=Radius',%20500,%20500);) since those are two pieces of information in the problem. The formula for the [circumference](javascript:def('/Glossary/glossaryterm.aspx?word=Circumference',%20500,%20500);) is http://algebralab.org/img/bfefb862-6bf2-420d-9e8f-97a85b4e3d4b.gif. We are told that the [circumference](javascript:def('/Glossary/glossaryterm.aspx?word=Circumference',%20500,%20500);) is 13.12 centimeters more than three times the radius. Three times the [radius](javascript:def('/Glossary/glossaryterm.aspx?word=Radius',%20500,%20500);) translates into 3*r*. Now we need to add 13.12 to that to get an [expression](javascript:def('/Glossary/glossaryterm.aspx?word=Expression%20',%20500,%20500);) for circumference.   
  
http://algebralab.org/img/4953c9bf-ef1f-4f39-9465-afccc78c44b1.gif  
  
We now have two expressions for circumference. Since the [circumference](javascript:def('/Glossary/glossaryterm.aspx?word=Circumference',%20500,%20500);) of a [circle](javascript:def('/Glossary/glossaryterm.aspx?word=Circle',%20500,%20500);) doesn’t change, these two expressions must be equal. Now we can set up the [equation](javascript:def('/Glossary/glossaryterm.aspx?word=Equation',%20500,%20500);)   
  
http://algebralab.org/img/88a0e6c4-26c7-444a-b705-2286ea28df96.gif

Step 5: Solve the equation.

In some classes your teacher may want you to leave http://algebralab.org/img/64215ca0-7dd4-4ea9-b30c-ebe912d46c96.gifin its exact form rather than approximating the value as 3.14. We will use the approximation here. If your teacher wants you to leave http://algebralab.org/img/c88d78f1-8684-454c-8156-16fbaa178170.gifas part of your answer, you should ask how to do that.   
  


Step 6: Answer the question in the problem

The problem asks us to find the [radius](javascript:def('/Glossary/glossaryterm.aspx?word=Radius',%20500,%20500);) of the clock face. We decided that r would be the radius, so we have *r* = 4. The [radius](javascript:def('/Glossary/glossaryterm.aspx?word=Radius',%20500,%20500);) of the clock [face](javascript:def('/Glossary/glossaryterm.aspx?word=Face%20',%20500,%20500);) is 4 centimeters. Don’t forget your units.

Step 7: Check the answer.

The answer makes sense and checks in our [equation](javascript:def('/Glossary/glossaryterm.aspx?word=Equation',%20500,%20500);) from Step 4.   
  
http://algebralab.org/img/293536ea-0e7a-45e1-97a9-c3c31fde27a8.gif