**Fair Share on Chores**

Wagon trains often put their wagons in a circle to make a corral for the livestock. It was only in the movies that wagon trains created a circle to protect themselves from Native Americans.

The Washburn family decides that someone needs to keep an eye on their animals during the night. They announce that their children will take shifts each night, with one child at a time guarding the animals. Altogether, the animals need to be watched for ten hours. This family has two girls and three boys.

This sounds simple—two hours each. But the girls have other chores, and so do the boys. To balance out other assigned chores, the Washburn family decides that there should be one length of time for each girl’s shift and another length of time for each boy’s shift.

1. How long would you suggest that each type of shift be? Provide at least three different pairs of answers.
2. Using *G* to represent the length of each girl’s shift and *B* to represent the length of each boy’s shift, write an equation expressing the fact that the total of all their shifts is ten hours.
3. Suppose you know how long each girl’s shift is. Describe in words how you could find the length of each boy’s shift.
4. Write your sentence from Question 3 as a function, expressing *B* in terms of *G*. That is, write an equation that begins *B* = and has an expression using *G* to the right of the equal sign.
5. Graph the function from Question 4 on your calculator. Check to see if your answers from Question 1 are on the graph.
6. Use the trace feature on your calculator to find three more pairs of possible shift lengths from your graph.

**More Fair Share on Chores**

As you saw in *Fair Share on Chores*, Washburn family’s two girls and three boys are responsible for watching the animals in shifts during the night.

After some experience, the family has decided that to balance out other chores, the shift for each boy should be half an hour longer than for each girl.

1. They have realized that as the season gradually changes, the total amount of time needed for the shifts is not always ten hours. Therefore, they want to know about combinations of shift lengths with different totals.
   1. What are some possible combinations of shift lengths in which the shift for each boy is half an hour longer than that for each girl? Give four possibilities.
   2. Describe in words how you could find the length of each boy’s shift if you knew the length of a girl’s shift.
   3. Use your answer to part b to write an equation in which *G* represents the length of each girl’s shift and *B* represents the length of each boy’s shift.
   4. Graph your equation on the calculator.
   5. For each combination that you gave in part a, state how much total time will be covered by all the children combined.
2. On a particular evening, it turns out that ten hours of animal watching is required after all. Find a pair of shift lengths that would total ten hours and still have the shift for each boy be half an hour longer than the shift for each girl.