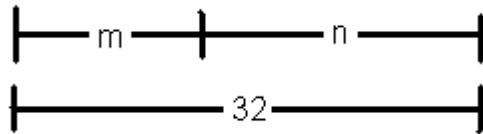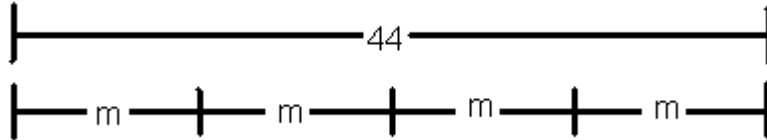# Systems of Equations
Activity #2: Finding Multiple Unknowns

Part 1 (Complete in Class)

For each of the following problems, find the values of the unknowns and explain how you got there.

1. The two diagrams below illustrate two relationships that you know about.
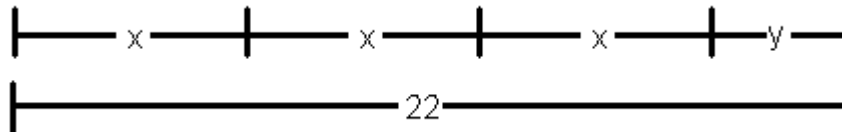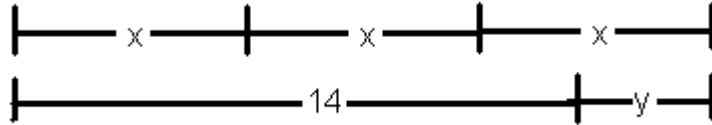

    a. Find the values of m and n. Show work using pictures.

    b. Explain how you did it.

_____

_____

_____

    c. Write out the two *simultaneous equations* that would represent this system.

2. The two diagrams below illustrate two relationships that you know about.

├─ x ─┼─ x ─┼─ x ─┤

├────── 14 ──────┼─y─┤

├─ x ─┼─ x ─┼─ x ─┼─y─┤

├────────── 22 ──────────┤

    a.   Find the values of x and y. Show work using pictures.

    b.   Explain how you did it.

_____

_____

_____

    c. Write out the two simultaneous equations that would represent this system.

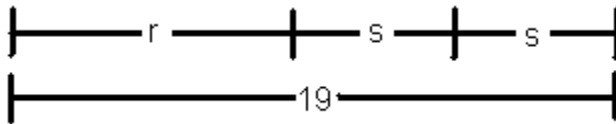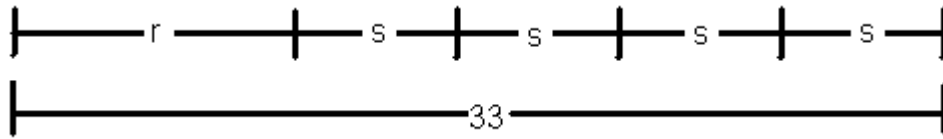3. The two diagrams below illustrate two relationships that you know about.

$$\vdash\!\!-r\!\!-\!\!+\!\!-s\!\!-\!\!+\!\!-s\!\!-\!\!+\!\!-s\!\!-\!\!+\!\!-s\!\!-\!\dashv$$

$$\vdash\!\!-\!\!-\!\!-\!\!-\!\!-\!\!-33\!\!-\!\!-\!\!-\!\!-\!\!-\!\!-\!\dashv$$

$$\vdash\!\!-r\!\!-\!\!+\!\!-s\!\!-\!\!+\!\!-s\!\!-\!\dashv$$

$$\vdash\!\!-\!\!-19\!\!-\!\!-\!\dashv$$

   a. Find the values of r and s. Show work using pictures.

   b. Explain how you did it.

   _____

   _____

   _____

   c. Write out the two simultaneous equations that would represent this system.

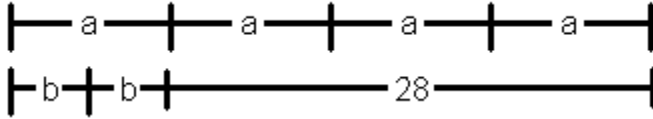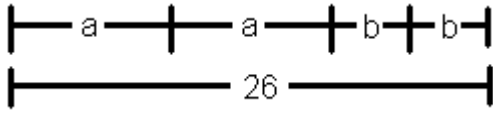4. The two diagrams below illustrate two relationships that you know about.

|— a —+— a —+b+b—|
|———— 26 ————|

|— a —+— a —+— a —+— a —|
|b+b+———— 28 ————|

    a. Jenny claims that looking at the bottom part of the diagram, you can figure out

       |— a —+— a —|

      what   is the same as. Explain why she is correct.

_____

_____

_____

    b. Use your answer to part A to help you find the values of the variables a and b.
       Show work using pictures.

5. Can z = 9 be a solution to the following system? Explain clearly.

|— x —+—— y ——+— z —+— z —|
|———————— 80 ————————|

|— x —+—— y ——|
|———— 62 ————|

_____

_____

_____
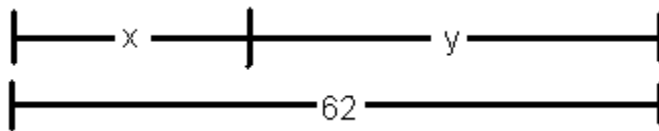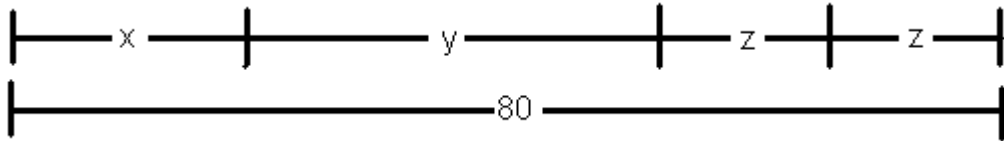
Part 2 (Complete for Homework): Puzzle Challenge

Solve the puzzle below. Show work using pictures and/or symbols in a way that will convince us you are correct!

- A puppy weighs one more pound than a kitten.
- Two hamsters weigh the same as a kitten.
- A puppy and a hamster together weigh 10 pounds.

How much does each pet weigh?

Puppy: _____

Hamster: _____

Kitten: _____

Work:

Explain how you know:

_____

_____

_____

_____

_____

_____