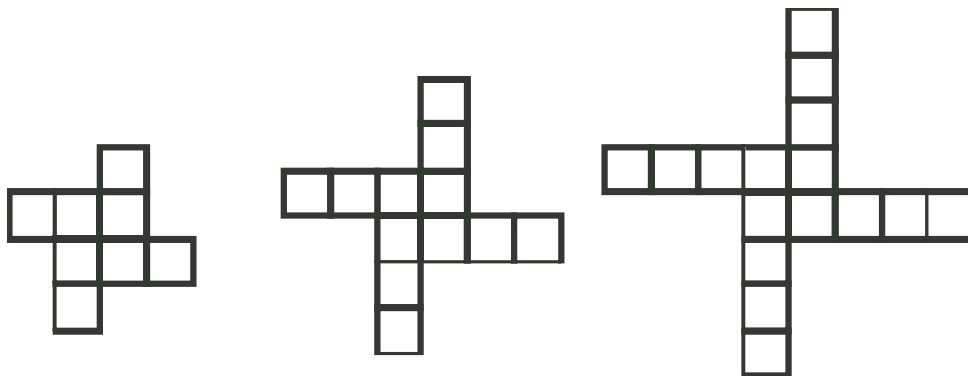**465 Early Algebra: Handle With Care**

Problem Set B12

Solve each problem. On some problems you will be asked to explain your thinking!

1a.   Draw the next shape in the pattern.

Without drawing the shapes how many squares will be in the:

1b. 10th shape
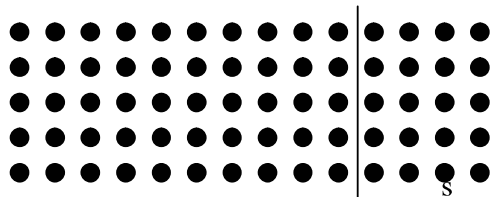1c. n^{th} shape
1d.   Using the figure explain why the rule for the nth shape works.

1e. Fill in the table.

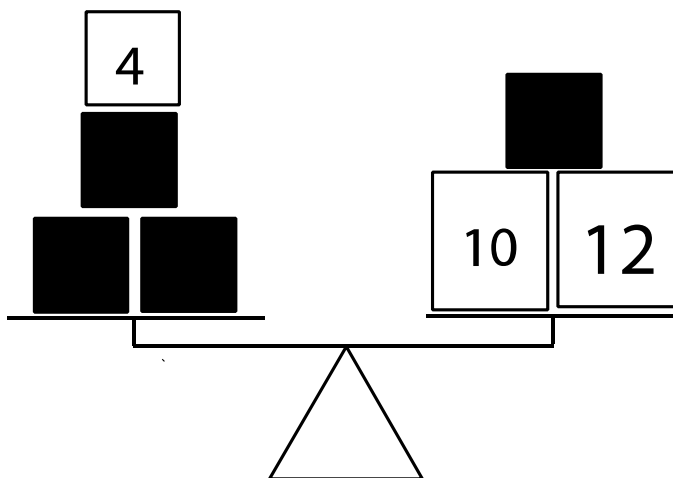| Figure #	Number of Squares in the Shape
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
25	
100	
n	

2.   How many dots are in this figure?

Cindy multiplied 5 x 14 to find the number of dots in the picture.
Charles multiplied 5 x 10 and then added it to 5 x 4 to find the number of dots in the
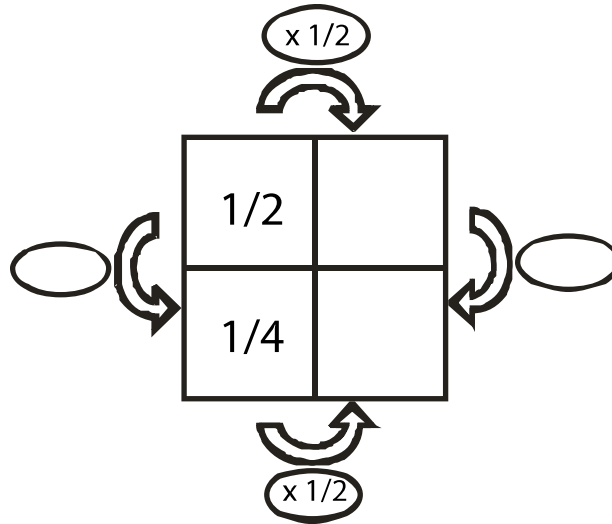picture.

b. Why do both methods give the same answer?

3.   Find the weight of the black square to make the scale balance.

4.   Find the missing numbers and the operations in the ratio box.

```
            ( x 1/2 )
          ⤵
      ┌──────┬──────┐
      │      │      │
   (  │ 1/2  │      │  )
  ( ) │      │      │ ( )
   (  ├──────┼──────┤  )
      │ 1/4  │      │
      │      │      │
      └──────┴──────┘
          ⤴
           ( x 1/2 )
```

5.   A loaded trailer truck weighs 26,643 kilograms. When the trailer is empty it weighs 10,547 kilograms. About how much does the load weigh?

       A.   14,000 kilograms
       B.   16,000 kilograms
       C.   18,000 kilograms
       D.   36,000 kilograms

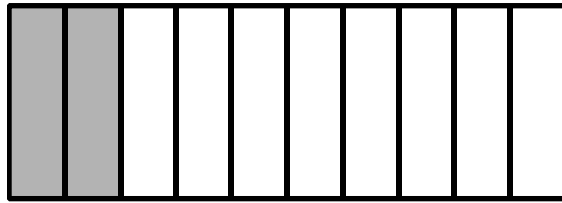6.   Fill in the missing numbers in the pattern and give the rule.

       __ __ 8 __ __ 26 __ __ __

       Rule _____

7.   I have exactly $10.00 in nickels, dimes, and quarters. If I have the same number nickels, dimes, and quarters, how many of each kind of coin do I have?

Problem Set B12-4

8.   Which number represents the shaded part of the figure (TIMSS, 1995)?

        a. 2.8
        b. 0.5
        c. 0.2
        d. 0.02

9.   If you could not multiply the two numbers on each side of the equation to show they are equal, how could you convince someone that the following equation is equal?

$$20 \times 16 = 40 \times 8$$

10.   List all the pairs of whole numbers that you can multiply together to get 72.

11.   The Integer Express is a train that travels back and forth on the number line railroad. The engineer makes the train move to the right by entering a positive number and to the left by entering a negative number. If he started at 0 and pushed -8 and then +5, where would he end up?

    -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10
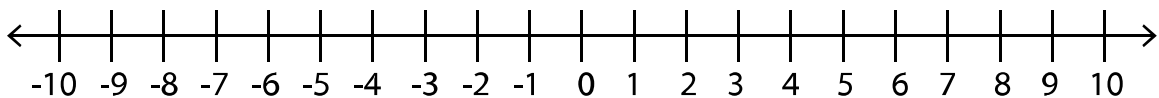
b.   The engineer sometimes forgets where he started. He knew he pushed -8 and +5. He ended up at -1. Where did he start?

    -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10