Name _____ Course _____ Date _____

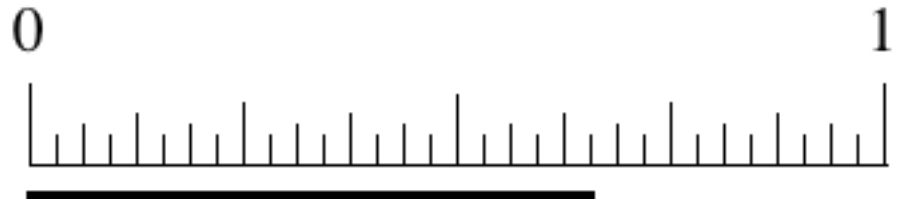
Diagnostic Quiz, Math for Elementary Teachers

Materials: centimeter ruler, protractor, scissors, (optional) precut triangles for the last problem. You may cut things out if it helps.

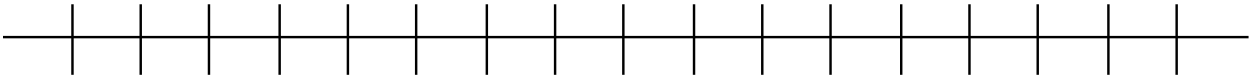
No calculator allowed.

Show work and/or explain, as appropriate.

1. In the imaginary country of Elbonia, the basic unit of length is the elbo. Here is a piece of a ruler in elbos. How long (in elbos) is the heavy line segment beneath the ruler?



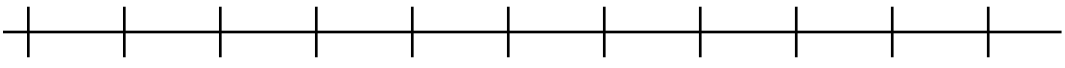
2. Fraction number line. Choose where to put 0 and 1 on the number line below, then label all the twelfths between 0 and 1. You might not need all the marks; add more if you need them.



3. Mark these numbers on the number line below: 0, 1, 10, 100, 1000, 10000.

Choose whatever units you like, but spacing should be consistent: if the space between two adjacent marks is 10 on one part of the number line, the same space should represent 10 on the other parts of the line.

If the positions of some numbers can't be easily seen, or won't fit on the paper, explain precisely where they are.



4. a. Arrange these numbers from smallest to largest: 0.0015, 0.0001, .0105, .00100, 0.01500 Put an = sign between any that are equal.

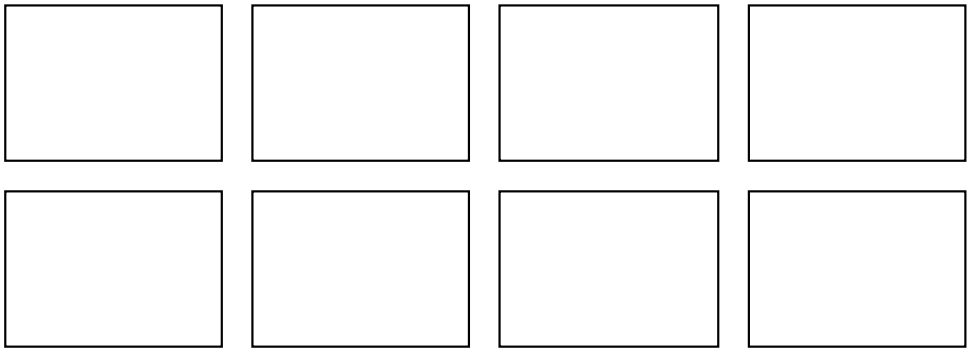
_____ _____ _____ _____ _____

smallest largest

4b. Dany was making a bar graph of ages of children in a school. The ages for each bar have a range of 2 years; one of the bars, Bar A has ages 6.2 to 8.2. Where should age 6 go?

a. In Bar A | b. In the previous bar | c. Right on the edge between Bar A and the previous bar | d. Not in any bar | e. Other

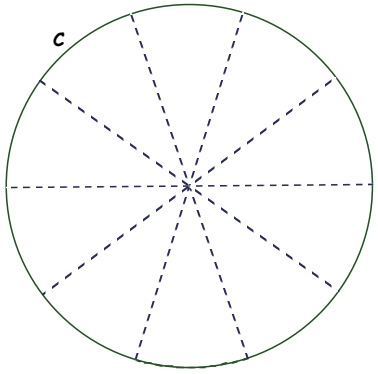
5. Each rectangle below represents a pan of brownies. Show 7/6 pan of brownies. (You might not need to use all the rectangles; draw more if you need more.)

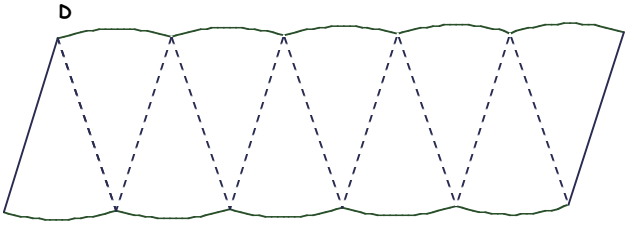


6. Don't use any measuring devices: just think. Fill in the blanks with <, =, or >. Briefly explain your reasoning for both answers.

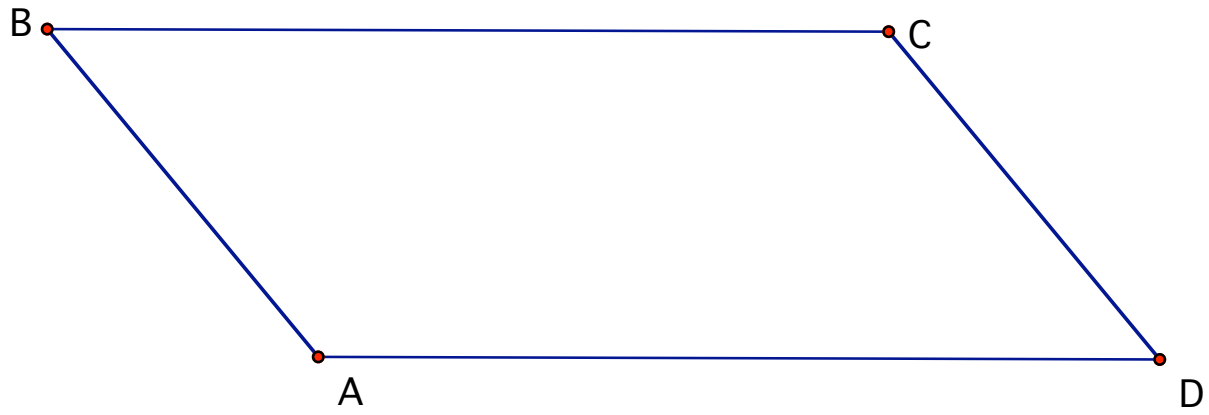
a. Area of C _____ Area of D

b. Perimeter of C _____ Perimeter of D





7. Use a protractor to measure the interior angles of this parallelogram.



angle A _____ angle B _____ angle C _____ angle D _____

8. How many square inches are in a square foot? _____

9. A garden is a rectangle, 5 yards by 2 yards. If 4 cubic yards of topsoil is spread evenly on the garden, how deep will it be?

10. Write a word problem about $3 \div \frac{1}{2}$, then solve it.

11. In elementary school students learn how to do whole number division with remainder: for example, 23 divided by 4 is 5, with a remainder of 3.

    A student used a calculator to divide 27,103,958 by 9487, and got 2856.95773.

    a. What is the whole number quotient? _____

    b. The remainder is (choose one)

i. 2856 ii. 0.95773 iii. 9086 iv. 25,958,274 v. 0

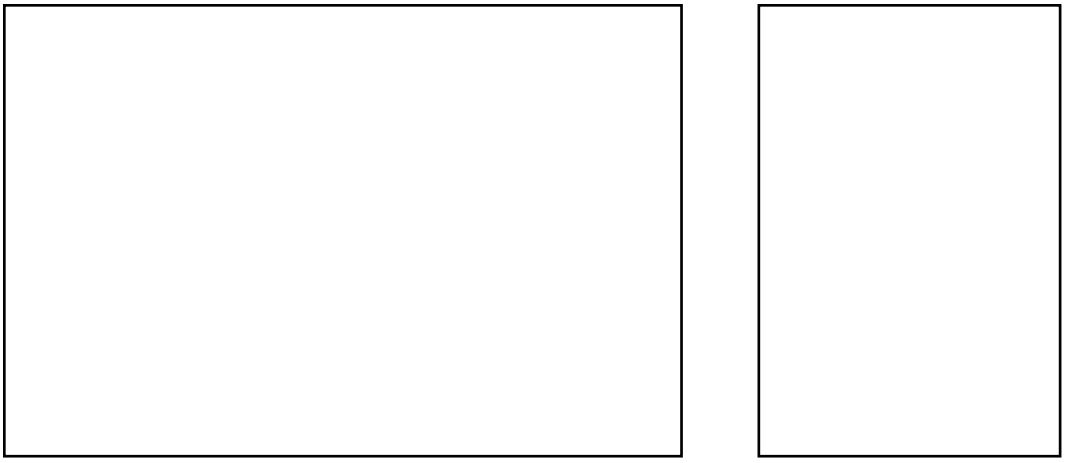
12. Is 12 a factor of $2 \times 3^4 \times 5^7 \times 7^5 \times 11^7$? How do you know?

13. Is 37 x 59 a prime? How do you know?

14. Which chocolate milk recipe will taste more chocolaty? Why?

Recipe	Milk (cups)	Chocolate powder (spoons)
A	3	8
B	2	5

15. Are the two rectangles below similar? Why?



16. Cut out the two identical triangles below, or use the precut ones if provided.

a. Use the two triangles to make a parallelogram, matching the short sides. Trace it on the back of this page.

b. Make and trace another parallelogram with the two triangles by matching the long sides.

c. Find the area of each parallelogram in square centimeters.

Possibly useful formula: area of a parallelogram = base x height