6th Grade Assignment – Week #6

<u>Individual Homework:</u> See how much you can do on Sheet #6.

<u>Group Assignment for Tuesday.</u>
1) Quinn and Beth have $25 combined. If Beth gives $6 to Quinn, then Quinn will have $3 more than Beth. How much money did Beth have in the beginning?
2) Kevin has 5 more marbles than Fred. Rex has 14 fewer marbles than Kevin and Fred combined. How many marbles do the boys have altogether, if Rex has 15 marbles?
3) If 4.6 pounds of potatoes cost $1.61, how much would 7.6 pounds of potatoes cost?

<u>Group Assignment for Thursday</u>:
Work on the two questions I posed in the lecture:
4) How can you copy a given angle onto a given line?
5) How can you construct a line that is perpendicular to a given line and passes through a point on the given line?
6) *Puzzle!* Jeff is 17 years older than Sue. In 11 years, Jeff will be twice as old as Sue. How old are they both now?

<u>Main Lesson Work (geometry)</u> – **Pages coming out of Lecture #1**

(For those who are doing the Geometric Drawing main lesson.)

What is listed below are suggestions for drawings. You should feel free to vary things, and make up your own drawings entirely. Be sure that it doesn't become overwhelming. As always, the goal should be quality rather than quantity.

There are two types of pages to be done in the main lesson book: geometric constructions, and geometric drawings. The *geometric drawings* should be done beautifully using colored pencils – each drawing has the possibility of a work of art! On the other hand, the *geometric constructions* pages should be done simply and clearly (but still neatly with colored pencils); unnecessary embellishments should be avoided. In general, with this block, main lesson book pages should not have borders.

Before you start making any main lesson pages, be sure to first practice drawing circles with your compass. Remember to have one hand holding the needle, and one hand holding the top of the compass.

- Main Lesson Book Page (Geometric Construction)
  Title: **Bisecting a Line**
  <u>Instructions</u>: Draw a line, then bisect it with a compass and straightedge. Repeat with a second line.
- Main Lesson Book Page (Geometric Construction) <Can be done on the same page as the above construction.>
  Title: **Bisecting an Angle**
  <u>Instructions</u>: Draw a random angle, then bisect it with a compass and straightedge. Repeat with a second angle.
- Main Lesson Book Page (Geometric Construction)
  Title: **The Hexagon and its Triangles**
  <u>Instructions</u>: Draw a large circle, mark the center, and draw a vertical diameter. Using the same compass setting that was used to draw the circle, put the compass needle at one end of the diameter, and then mark two places on the circle. Now do the same from the other end of the diameter. You should now have six equally-spaced points on the circle. Draw the hexagon, and the other two diagonals of the hexagon (which are also diameters of the circle). Beautifully, but simply, shade in the outside of the hexagon. Also shade in (perhaps less dramatically) the six triangles.

<u>Main Lesson Work (geometry)</u> – **Pages coming out of Lecture #2**

- (Geometric Drawing)   Title: **The Hexagon and its Circles**
  <u>Instructions</u>: Lightly draw a large circle, and mark the six points of the hexagon. With the same compass setting, place the needle at each one of these points and draw a new circle. All six of these circles should pass through the center of the original circle. Have fun coloring it in beautifully!
- (Geometric Drawing)   Title: **The 12-Division of the Circle**
  <u>Instructions</u>: Draw a large circle, and then mark the six points of the hexagon. Now bisect each of the arcs (using the same method as bisecting a line) to locate 6 more points on the circle. How many equilateral triangles can be drawn between these 12 points? Draw all of them – each in a different color. Go over the circle in another color.
  <u>Extra Drawing</u>!! Do another 12-division, but this time draw squares between the 12 points.
- (Geometric Drawing)   Title: **The Limaçon**
  <u>Instructions</u>:
  - On a clean piece of paper that is at least 11 by 14 inches, lightly draw a circle where the center is 2 cm above the center of the page (held in "portrait orientation") and the radius is 3.5 cm.
  - Using the same compass setting, mark the six points of the hexagon (6-division) with small dots in black ink. Now, carefully using only your eye, mark in ink 6 more points which are halfway between the first six points. (Now you have 12 points on the circle.) Now mark 12 more points in ink, which are halfway between, which gives a total of 24 points. Erase everything except for the 24 points.
  - In ink, mark a point (called the "cusp") which is 3 cm above the edge of the circle.
  - Create your limaçon by placing your compass needle, in turn, on each one of the 24 points (of the original circle), and, for each one, adjust your compass in order to draw a full circle that goes through the cusp.
  - With a bold color, draw a thick curve that goes around the outside of the limaçon. This curve should be smooth, and barely touch the circles that you drew. Be sure that the curve shows the inner loop of the limaçon.
  - If you wish, you may use color to shade inside the limaçon, but it should be done fairly lightly, so to not distract from the important shape of the limaçon itself.
  - <u>Extra Drawing</u>. If you wish, you can redo the limaçon, but this time have the cusp on the edge of the original circle, or maybe 1 cm inside the circle. How do you think the limaçon will turn out differently?

6th Grade Math − **Sheet #6**

Do it in your head.

1) $1200 \cdot 600$

2) $48{,}000 \div 8{,}000$

3) $4.532 \cdot 100$

4) $932.3 \div 100$

5) $11 \cdot 89$

6) $110 \cdot 46$

7) $350 \cdot 4$

8) $215 \cdot 4$

9) $0.06 \cdot 0.05$

10) $0.002 \cdot 0.04$

11) $1800 \div 4$

12) $82 \div 4$

13) $106 \cdot 112$

14) $102 \cdot 103$

15) $1.15 \cdot 1.02$

16) 2^3

17) 3000^2

18) $\frac{1}{3} + \frac{1}{5}$

19) $\frac{5}{6} \cdot \frac{9}{10}$

20) $\frac{7}{12} \cdot \frac{5}{12}$

21) $\frac{7}{12} + \frac{5}{12}$

22) $11.5 - 0.24$

(Have you memorized these?)

23) $16 \cdot 3$

24) 13^2

25) $14 \cdot 3$

26) $15 \cdot 5$

27) $13 \cdot 3$

28) 18^2

29) 14^2

30) $25 \cdot 3$

31) $18 \cdot 2$

32) $13 \cdot 4$

33) $25 \cdot 5$

34) 16^2

35) 15^2

36) 25^2

Fractions & decimals.

37) $\texttt{512.7 + 6.48}$

38) $\texttt{80.4 - 3.47}$

39) $(0.0087)^2$

40) $(0.02)^5$

41) $\left(3\frac{2}{3}\right)^2$

42) Convert to mixed.
$$\frac{65}{9}$$

43) Convert to improper.
$$8\frac{4}{9}$$

44) $\frac{5}{6} + \frac{5}{8}$

45) $\frac{48}{49} \cdot \frac{35}{36}$

46) $5\frac{1}{2} \cdot 3\frac{2}{3}$

47) $5\frac{1}{2} \div 3\frac{2}{3}$

48) $3\frac{2}{3} \div 5\frac{1}{2}$

49) $3\frac{3}{4} \cdot \frac{17}{3}$

50) *Short Division.* Leave your answer as a mixed number.

$35451 \div 6$

Long Division.

Fix the divisor.

Make the divisor easier by getting rid of the decimal or the ending zeroes. *Do not actually divide yet.* (See examples on the previous worksheet, if necessary.)

51) $700 \div 6.6$
We change it to:

52) $41.7736 \div 0.047$
We change it to:

53) $8.39 \div 1800$
We change it to:

Divide. Leave your answers as exact decimals (perhaps repeating).

54) $700 \div 6.6$

55) $41.7736 \div 0.047$

56) $8.39 \div 1800$

57)
```
     784
     269
     928
      76
     841
     797
 +   473
 _____
```

58) Betty earns $235 per week (after tax). After 5 weeks of work, she put $641 of her earnings into her savings account and then evenly divided the rest between her three sisters. How much did each sister get?

Convert to Decimals.

59) Convert each fraction into an equal decimal. Divide when necessary.

$\frac{1}{2} =$ $\frac{1}{8} =$

$\frac{1}{3} =$ $\frac{3}{8} =$

$\frac{2}{3} =$ $\frac{5}{8} =$

$\frac{1}{4} =$ $\frac{7}{8} =$

$\frac{3}{4} =$ $\frac{1}{9} =$

$\frac{1}{5} =$ $\frac{2}{9} =$

$\frac{2}{5} =$ $\frac{4}{9} =$

$\frac{3}{5} =$ $\frac{5}{9} =$

$\frac{4}{5} =$ $\frac{7}{9} =$

$\frac{1}{6} =$ $\frac{8}{9} =$

$\frac{5}{6} =$