1. Use your ruler to draw a rectangle that measures $4\frac{1}{2}$ by $2\frac{3}{4}$ inches, and find its area.

\[
\frac{9}{2} \times 4 = \frac{9}{8} = 12\frac{3}{8} \\
A = 12\frac{3}{8} \text{ in}^2
\]

2. Heather has a rectangular yard. She measures it and finds out it is $24\frac{1}{2}$ feet long by $12\frac{4}{5}$ feet wide.
   a. She wants to know how many square feet of sod she will need to completely cover the yard. Draw the yard, and label the measurements.
   b. How much sod will Heather need to cover the yard?
   \[
   12\frac{4}{5} \times 24\frac{1}{2} = \frac{64}{5} \times \frac{49}{2} = \frac{3136}{10} = \frac{1568}{5} = 313\frac{3}{5}
   \]
   She'll need $313\frac{3}{5}$ ft$^2$ of sod to cover her yard.
   c. If each square foot of sod costs 65 cents, how much will she have to pay to cover her yard?
   \[
   313\frac{3}{5} = 313.6 \times \frac{313.6}{15680} + 1580 = 203.84 \text{ to cover her yard.}
   \]
3. A rectangular container that has a length of 30 cm, a width of 20 cm, and a height of 24 cm is filled with water to a depth of 15 cm. When an additional 6.5 liters of water is poured into the container, some water overflows. How many liters of water overflow the container? Use words, pictures, and numbers to explain your answer. (Remember 1 cm³ = 1 mL)

\[30 \times 20 \times 24 = 720 \times 20 = 14,400 \text{ cm}^3\]

\[30 \times 20 \times 15 = 450 \times 20 = 9,000 \text{ cm}^3\]

Volume of the container = 14,400 cm³

Volume of water = 9,000 cm³

\[14,400 - 9,000 = 5,400 \text{ cm}^3\]

Room left in the container = 5,400 cm³ or 5.4 L

6.5 L - 5.4 L = 1.1 L  The water overflowed by 1.1 L or 1,100 cm³.

4. Jim says that a 2 1/2 inch by 3 1/4 inch rectangle has a section that is 2 inches × 3 inches and a section that is 1 1/2 inch by 1 1/4 inches. That means the total area is just the sum of these two smaller areas, or 6 1/8 in². Why is Jim incorrect? Use an area model to explain your thinking. Then, give the correct area of the rectangle.

In order to find the area, all sections of the area model must be calculated and added.

\[6 + \frac{1}{2} + 1\frac{1}{2} + \frac{1}{8} = 8\frac{1}{8} \text{ in}^2\]

5. Miguel and Jacqui built towers out of craft sticks. Miguel’s tower had a 4-inch square base. Jacqui’s tower had a 6-inch square base. If Miguel’s tower had a volume of 128 cubic inches and Jacqui’s had a volume of 288 cubic inches, whose tower was taller? Explain your reasoning.

Both towers have the same height of 8 in.

I divided the volumes by the bases and got a height of 8 in.
6. Read the statements. Circle True or False. Explain your choice for each using words and/or pictures.

a. All parallelograms are quadrilaterals.  
   All parallelograms have 4 straight sides, so all parallelograms are a type of quadrilateral.  
   True  False

b. All squares are rhombuses.  
   All rhombuses have 4 equal sides, and so do all squares. Some rhombuses do not have 4 right angles, so not all rhombuses are squares.  
   True  False

c. Squares are rhombuses, but not rectangles.  
   All squares are both rhombuses and rectangles. Squares and rhombuses both have 4 equal sides. Squares and rectangles both have 4 right angles.  
   True  False

d. The opposite angles in a parallelogram have the same measure.  
   The opposite sides of parallelograms are parallel and equal in length. The four angles always add up to 360°. Opposite angles are always equal.  
   True  False

e. Because the angles in a rectangle are 90°, it is not a parallelogram.  
   All rectangles are parallelograms because all rectangles have 2 pairs of parallel sides.  
   True  False

f. The sum of the angle measures of any trapezoid is greater than the sum of the angle measures of any parallelogram.  
   The sum of the 4 angles of any quadrilateral, including trapezoids and parallelograms, is always 360°.  
   True  False

g. The following figure is a parallelogram.  
   Opposite angles in a parallelogram are always equal. If you add up these angles (60° + 60° + 115° + 115°) the sum is only 350°. Therefore, the opposite angles can’t be equal, and this isn’t a parallelogram. The angles need to add up to 360°.  
   True  False