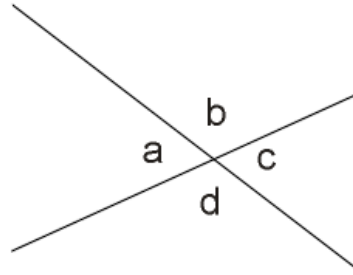
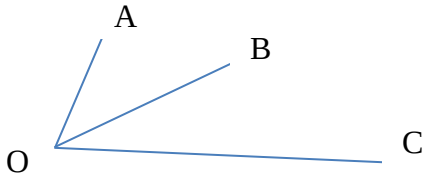


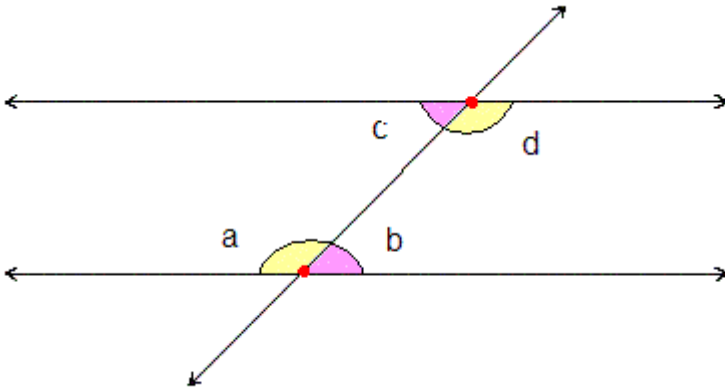
MATH 5: GEOMETRY: ANGLES AND AREA
DECEMBER 13, 2020

Angles!

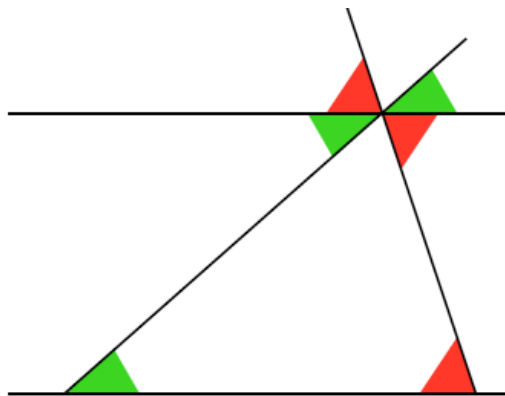
- Angles and their measurement. **Acute, right, obtuse** angles.
- **Perpendicular** lines: lines that form 90° angle.
- Addition rule for angles: if two angles are **adjacent** (have a common side), then their measures add up: $\angle AOB + \angle BOC = \angle AOC$



- Special angles: angles whose sum is 90° are called **complementary**, and angles whose sum is 180° are called **supplementary**.
- Using a ruler draw a picture similar to the one below and prove that opposite angles are the same. Use the knowledge that straight angle is 180° .
- **Interior** angles **Alternate** angles:



Using ruler draw the picture similar to the one below, name the angles and prove that sum of the angles in a triangle is 180° .



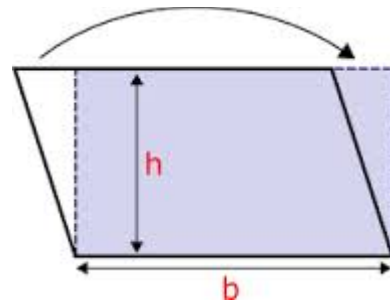
Areas of parallelogram, trapezoid, triangle.

1. Parallelogram.

Area = base x height

$$S = b \cdot h$$

Proof is on the colored drawing.

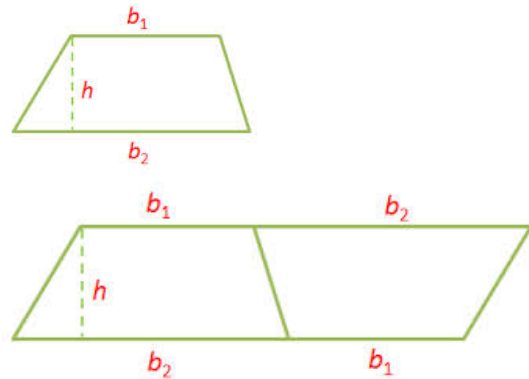


2. Trapezoid

Area = $\frac{1}{2}$ height $\cdot$ (base1 + base2)

$$S = \frac{1}{2} h (b_1 + b_2)$$

Proof is on the drawing

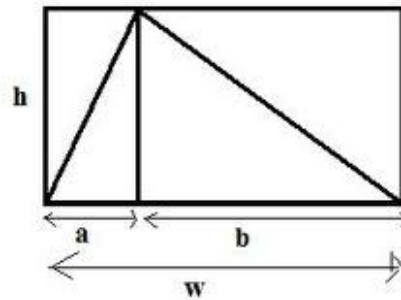


3. Triangle

Area = $\frac{1}{2}$ height $\cdot$ base

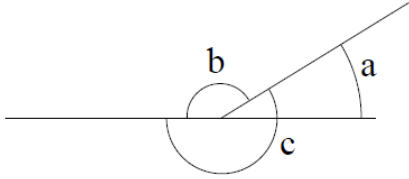
$$S = \frac{1}{2} hw$$

Proof is on the drawing.

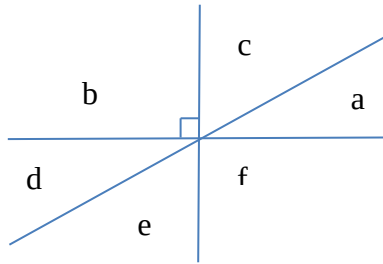


MATH 5: HOMEWORK 10
DECEMBER 13, 2020

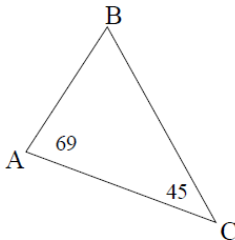
1. In the figure below, $\angle a = 30^\circ$. How large are two other angles?



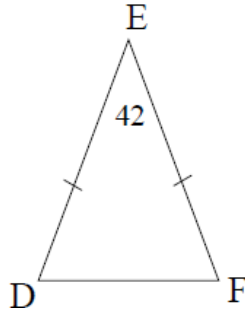
2. In the figure below, $\angle a = 30^\circ$ and $\angle b$ is the right angle. Can you find the sizes of all other angles in the figure?



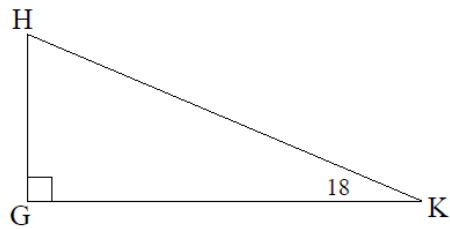
3. Find the unknown angles. The figures are not to scale, so don't try measuring angles with the protractor.
(a) Find $\angle ABC$.



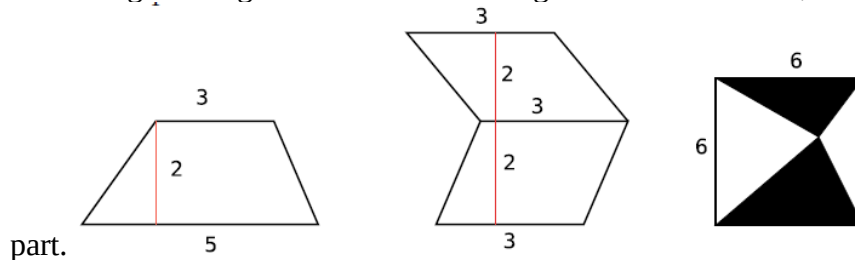
- (b) The triangle $\triangle DEF$ is symmetric (isosceles): $\angle EDF = \angle EFD$. Find $\angle EDF$.



- (c) Find $\angle GHK$.



4. Compute the area of the figures below. The picture is not to scale, so do not try measuring the lengths - use the numbers given. In the last one, find the area of the shaded



5. Perform calculations in the base 4:

a.

$$\begin{array}{r} 333 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 1111 \\ - 222 \\ \hline \end{array}$$

$$\begin{array}{r} 3231 \\ - 1321 \\ \hline \end{array}$$

- b. Write a formula, instruction, or algorithm on how to translate base 4 number **abcd** to base 10 number, where a, b, c, d can be 0, 1, 2, or 3.

6. Perform calculations in the base 13:

$$\begin{array}{r} 9999 \\ + 2222 \\ \hline \end{array}$$

$$\begin{array}{r} 1A2B3C \\ + 999999 \\ \hline \end{array}$$

$$\begin{array}{r} 9C138 \\ - 5A001 \\ \hline \end{array}$$

7. *Find the angle each of the hands makes with the vertical line at 7:12pm, and find the angle between the two hands.