MATH 5e: Class Work 27

Topics: Algebra review. Congruent figures

Two lines with a transverse

α α

Opposite angles, formed from crossing straight lines, are equal.

 $\angle \alpha = \angle \alpha$ – opposite $\angle \alpha + \angle \beta = 180^{0}$ – on a straight line, Or complementary angles

 l_1 5 $l_1 \parallel l_2$ t is transversal: $\angle 1 = \angle 2 = \angle 3$

 $\angle 1 = \angle 3$ = alternate interior angles $\angle 1 = \angle 2$ = corresponding angles $\angle 4 = \angle 2$ = alternate exterior angles $\angle 5 = \angle 2$ = same side (consecutive) exterior angles $\angle 6 = \angle 3$ = same side (consecutive) exterior angles

Parallelogram: A parallelogram is a quadrilateral in which opposite sides are parallel. The sum of angles of an n-gon: is $(n - 2) \times 1800$.

Triangle Congruency



Rule 1 (Axiom 1) SSS rule

The triangles $\triangle ABC \cong \triangle A'B'C'$ are congruent when their sides are equal: AB = A'B', BC = B'C', AC = A'C'

Rule 2 (Axiom 1) SAS rule

The triangles $\triangle ABC \cong \triangle A'B'C'$ are congruent when two sides and the angle between them are equal AB = A'B', AC = A'C' and $\angle CAB = \angle C'A'B'$

Rule 3 (Axiom 1) ASA rule

The triangles $\triangle ABC \cong \triangle A'B'C'$ are congruent when two angles and the side between them are equal $\angle CAB = \angle C'A'B', AB = A'B'$, and $\angle ABC = \angle A'B'C'$

Problems: Geometry

- The segments AC and BD intersect at point O, which splits each into two equal parts (point O is a segment bisector). Show (prove) that
- a) $\triangle AOB \cong \triangle COD$
- b) $\angle A = \angle C$
- c) $AB \parallel CD$
- 2. ABCD is a parallelogram. Prove that
 - a) $\angle B = \angle D$ (opposite angles are equal)
 - b) the diagonals are split into two equal segments by the crossing point
- 3. ABCD a parallelogram where $DE \perp AB$ and $CF \perp AF$ Prove that:
 - a) $\triangle AED \cong \triangle BFC$
 - b) That the area of the parallelogram is $A = AD \cdot AE$ Area = Base x height
 - c) If the area of ABCD is $24 cm^2$, AB = 6 cm and AD = 5 cm, what is the size of AE?

Additional problems

4. ABCD is a rectangle. Prove that $\triangle ABC \cong \triangle ABD$.









- 5. The triangle ightarrow ABC is an isosceles triangle where angle $ightarrow A = 50^\circ$. Line $PQ \parallel AC$.
 - a) Find the measure of angles P and Q
 - b) prove that $\triangle PQB$ is an isosceles

A

B

Problems: Review – operations with negative numbers and powers

- 1. Calculate: a) $-0.03 \cdot 0.4 \cdot (-0.005) =$
 - b) $5 5 \cdot (-3.2) =$
 - c) The reciprocal fraction of $-3\frac{3}{5} =$

d)
$$-1\frac{2}{5}:\frac{7}{15}=$$

- e) $4 \cdot 10^4 + 5 \cdot 1 \cdot 0^2 + 10^0 + 2 \cdot 10^{-1} + 10^{-3} =$
- 2. Present the answer as a power.

$$\frac{(-2)^9 \cdot 3^8}{2^3 \cdot (-9)^4} =$$

- 3. Solve the equations
 - a. -45: x = 1.5
 - b. $-6 3 \cdot x = 0.7 1.3$