Khan Academy exercises: "Congruence" and other recommended topics

HW #5 - Due Fri, Dec 11
Ch 5 Review Problems pp. 206-209 #15-50
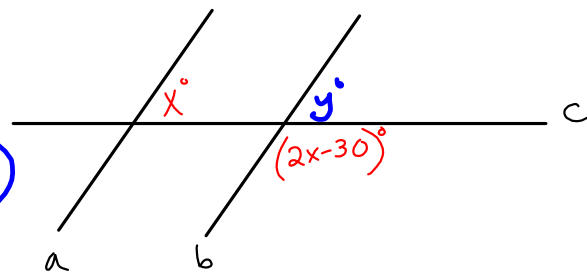
HW #6 - Due Wed. Dec 16
Ch 6 Review Problems pp. 250-254 #9-19, 33-53

Test #2 - Wed. Dec 16

SAT Problem

Given: a||b

$x = y$ (corresponding ∠'s)
$y + 2x - 30 = 180°$ (linear pair)

45. Write an equation relating the measures of the two indicated angles.

$x + 2x - 30 = 180°$
$3x = 210$

46. Find the measure of the acute angle.

$x = 70°$

47. Find the measure of the obtuse angle.

$2x - 30° = 110°$

Theorem 17: Equal corresponding angles mean that lines are parallel.
Corollary 1: Equal alternate interior angles mean that lines are parallel.
Corollary 2: Supplementary interior angles on the same side of a transversal
mean that lines are parallel.
Corollary 3: In a plane, two lines perpendicular to a third line are parallel.

The Parallel Postulate – Through a point not on a line, there is exactly
one line parallel to the given line.

Theorem 18: In a plane, two lines parallel to a third line are parallel to each other.

Theorem 19: Parallel lines form equal corresponding angles.

Corollary 1: Parallel lines form equal alternate interior angles.

Corollary 2: Parallel lines form supplementary interior angles on the same side of a transversal.
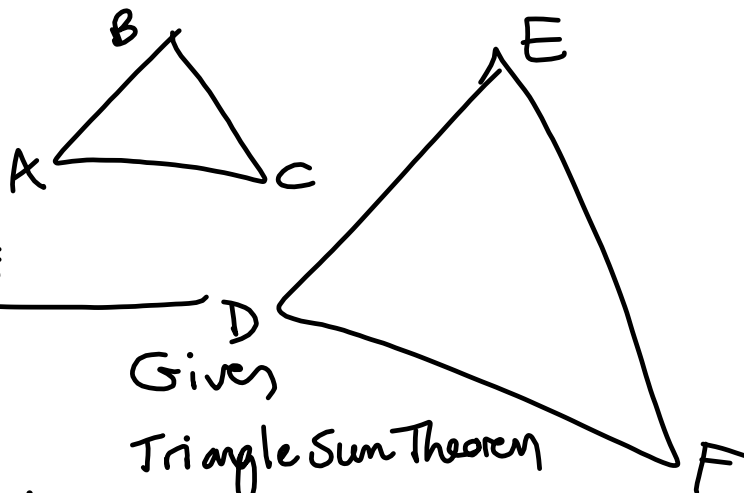
Corollary 3: In a plane, a line perpendicular to one of two parallel lines is also perpendicular to the other.

Theorem 20: The Angle Sum Theorem – The sum of the angles of a triangle is 180°.

Corollary 1: If two angles of one triangle are equal to two angles of another triangle, the third angles are equal.

Given: $\angle A = \angle D$
$\angle C = \angle F$

Want to prove
that $\angle B = \angle E$

Proof:
1. $\angle A = \angle D, \angle C = \angle F$　　　Given
2. $\angle A + \angle B + \angle C = 180°,$　　　Triangle Sum Theorem
$\angle D + \angle E + \angle F = 180°$
3. $\angle A + \angle B + \angle C = \angle D + \angle E + \angle F$　　　substitution
4. $\angle D + \angle B + \angle F = \angle D + \angle E + \angle F$　　　substitution
5. $\angle B = \angle E$　　　Subtraction

Corollary 2: The acute angles of a right triangle are complementary.

Given: $\triangle ABC$ is a right triangle
with $\angle C$ the right angle.

Prove: $\angle A$ and $\angle B$ are complementary.

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1. Given
2. $\angle C = 90°$ right $\angle$'s measure 90°
3. $\angle A + \angle B + \angle C = 180°$ Triangle Sum Theorem
4. $\angle A + \angle B + 90° = 180°$ Substitution
5. $\angle A + \angle B = 90°$ Subtraction
6. $\angle A$ and $\angle B$ are complementary   complementary $\angle$'s sum to 90°.

Corollary 3: Each angle of an equilateral triangle is 60°.

Given: $\triangle ABC$ is equilateral

Prove: $\angle A = 60°$, $\angle B = 60°$, $\angle C = 60°$

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1. Given
2. $\triangle ABC$ is equiangular   equilateral $\triangle$'s are equiangular
3. $\angle A = \angle B = \angle C$ equiangular $\triangle$'s have all equal angles
4. $\angle A + \angle B + \angle C = 180°$ $\triangle$ Sum Theorem
5. $\angle A + \angle A + \angle A = 180°$ Substitution
   $3\angle A = 180°$ Simplification
6. $\angle A = 60°$ Division
7. $\angle B = 60°$, $\angle C = 60°$ Substitution

Theorem 20: An exterior angle of a triangle is equal to the sum of the remote interior angles.

Given: $\triangle ABC$
w/ exterior angle $\angle 4$

Prove: $\angle 1 + \angle 2 = \angle 4$
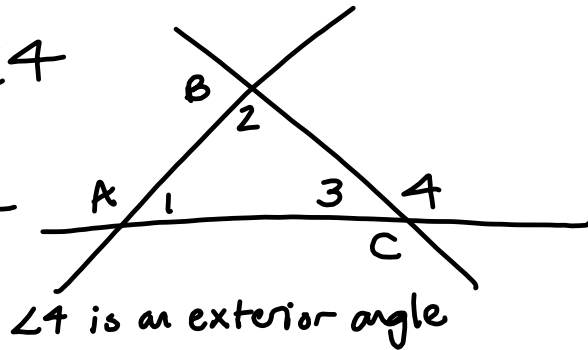
1. Gives

2. $\angle 3$ and $\angle 4$ are a linear pair

3. $\angle 3$ and $\angle 4$ are supplementary

4. $\angle 3 + \angle 4 = 180°$

5. $\angle 1 + \angle 2 + \angle 3 = 180°$

6. $\angle 1 + \angle 2 + \angle 3 = \angle 3 + \angle 4$

7. $\angle 1 + \angle 2 = \angle 4$

$\angle 4$ is an exterior angle

$\angle$'s in a linear pair are supplementary

Supp. $\angle$'s sum to 180°

$\triangle$ sum theorem

substitution

subtraction