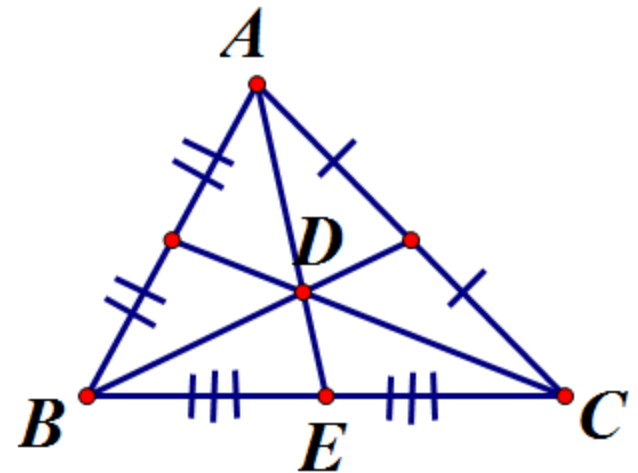# Monday, November 19, 2012

Agenda:

- TISK Problems & 2 MM
- Homework Check/Discuss
- Lesson 6-3: Rectangles
- Homework: Finish packet (due 11/27)

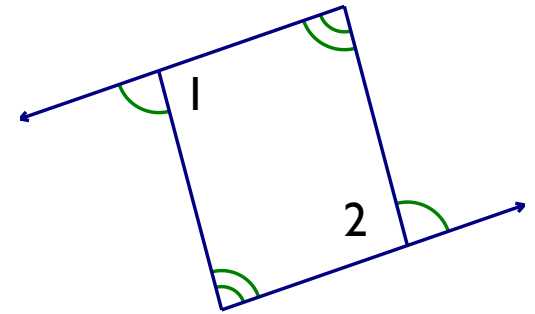TISK Problems

1) Factor: $15x^2 + 22x + 8$

2) Simplify: $4y - \dfrac{18y+6}{3}$

3) If DE = 12, what is the distance from A to D?

Homework Check

6. Yes; you can use the $\cong$ Supplements Theorem to show $\angle 1 \cong \angle 2$, then opp. $\angle$s are $\cong \therefore$ it's a parallelogram.

7. Yes; one pair of opp. sides is both $\cong$ and $\parallel \therefore$ it's a $\parallel$ogram

8. No; not enough information given.

9. $x = -2$ or 3; $y = \pm 7$

10. $x = 64$; $y = 23.5$

Homework Check

Statement	Reason
1) $\angle A \cong \angle C; \angle B \cong \angle D$	1) Given
2) $m\angle A + m + x = 180; \ m\angle C + n + y = 180;$	2) Δ Sum Th.
3) $m\angle A = m\angle C, m\angle B = m\angle D$	3) Def. $\cong$ $\angle$s
4) $m\angle B = m + n; \ m\angle D = x + y$	4) $\angle$ + Post.
5) $m\angle A + m + x + m\angle C + n + y = 360$	5) Addition Prop of =
6) $m\angle A + m\angle B + m\angle C + m\angle D = 360$	6) Substitution Prop of =
7) $2m\angle A + 2m\angle B = 360;$ $2m\angle B + 2m\angle C = 360$	7) Substitution Prop of =
8) $m\angle A + m\angle B = 180; m\angle B + m\angle C = 180$	8) Division Prop of =
9) $\angle A$ and $\angle C$ are supp. to $\angle B$	9) Def. Supp. $\angle$s
10) *ABCD* is a parallelogram	10) Def. parallelogram

Homework Check

| Statement	Reason
1) *ABCDEF* is a regular hexagon	1) Given
2) $\overline{AF} \cong \overline{CD}, \overline{AB} \cong \overline{BC}, \overline{ED} \cong \overline{EF}$	2) Def. regular hexagon
3) $\angle B \cong \angle E$	3) Def. regular hexagon
4) $\triangle ABC \cong \triangle DEF$	4) SAS Post.
5) $\overline{AC} \cong \overline{DF}$	5) CPCTC
6) *FDCA* is a parallelogram	6) If opp. sides are $\cong \Rightarrow$ it is a ‖ogram

§6.3 Rectangles

- Definition
  - Rectangle
    - A parallelogram is a rectangle if and only if it has 4 congruent angles.

Example. Using rectangle properties.

In the diagram, *EFGH* is a rectangle. What is the value of *y*?
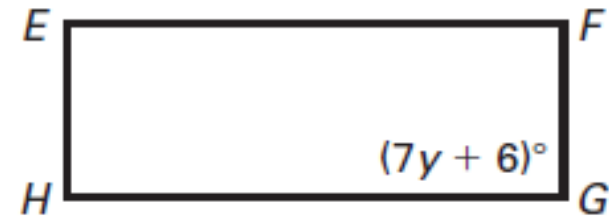
All four angles of a rectangle are __right angles__ . So, $m\angle G = $ __90__°.

$$(7y + 6)° = \underline{90}°$$ Write equation.

$$7y = \underline{84}$$ Subtract _6_ from each side.

$$y = \underline{12}$$ Divide each side by _7_.

Theorems

A parallelogram is a rectangle if and only if its diagonals are **congruent** .

ABCD is a rectangle if and only if $\overline{BD} \cong \overline{AC}$.
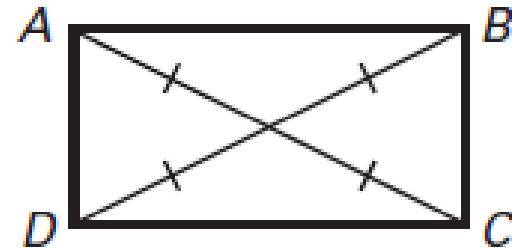
How do you check to see if a quadrilateral is a rectangle?

- First check to see if it is a parallelogram:
  - Opposite sides are parallel.
  - Opposite sides are congruent.
  - Opposite angles are congruent.
  - Diagonals bisect each other.
  - One pair of opposite sides are both congruent and parallel.
- Then, check to see if it's a rectangle.
  - All 4 angles are right angles.
  - Diagonals are congruent.

Example. Decide whether the statement is true or false. Explain your reasoning.

- If a quadrilateral has opposite sides that are congruent, then it is a rectangle.

False; a quadrilateral with opposite sides congruent only proves it is a parallelogram, not necessarily a rectangle.

Example. Determine if the vertices form a rectangle.

- *A*(-3, 1)
- *B*(4, 8)
- *C*(7, 5)
- *D*(0, -2)