No Content Mastery Quiz today!

Grab a SM2 book from your table

and tear out all of chapter 3

(pg. 209-256)

Feb 27-8:47 AM

3.1

Inside Out

Triangle Sum, Exterior Angle, and Exterior Angle Inequality Theorems

PG. 211-12 IN YOUR BOOK

1. Draw any triangle on a piece of paper. Tear off the triangle's three angles. Arrange the angles so that they are adjacent angles. What do you notice about the sum of these three angles?

They make a straight angle.

The **Triangle Sum Theorem** states: "the sum of the measures of the interior angles of a triangle is 180°."
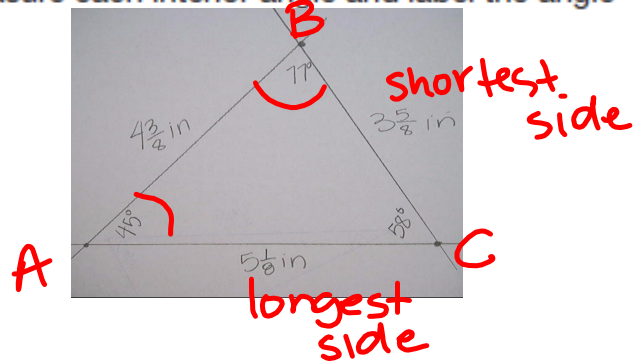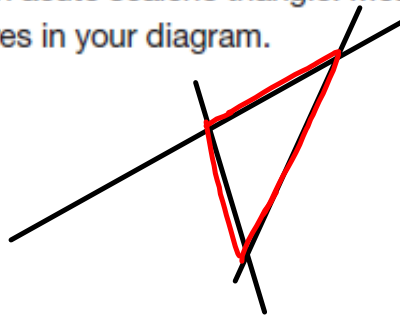
2. Prove the Triangle Sum Theorem using the diagram shown.
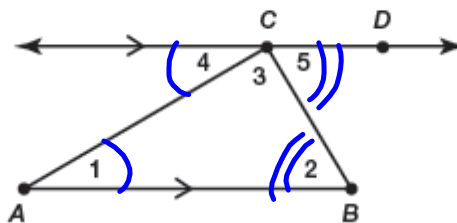
Given: Triangle ABC with $\overline{AB} \parallel \overline{CD}$

Prove: $m\angle 1 + m\angle 2 + m\angle 3 = 180°$

PG.213 IN YOUR BOOK

1. Consider the side lengths and angle measures of an acute triangle.

    a. Draw an acute scalene triangle. Measure each interior angle and label the angle measures in your diagram.

    b. Measure the length of each side of the triangle. Label the side lengths in your diagram.

    c. Which interior angle is opposite the longest side of the triangle?

       ∠B

    d. Which interior angle lies opposite the shortest side of the triangle?

       ∠A

PG.214 IN YOUR BOOK

2. Consider the side lengths and angle measures of an obtuse triangle.

   a. Draw an obtuse scalene triangle. Measure each interior angle and label the angle measures in your diagram.

   longest side

   shortest side

   b. Measure the length of each side of the triangle. Label the side lengths in your diagram.

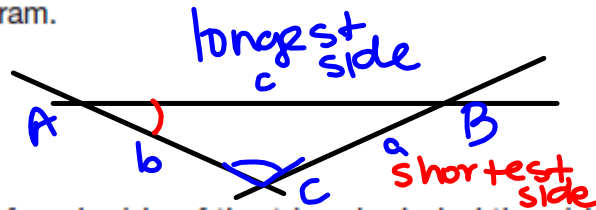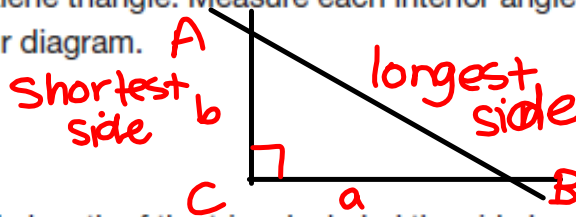   c. Which interior angle lies opposite the longest side of the triangle?

   ∠C or ∠ACB

   d. Which interior angle lies opposite the shortest side of the triangle?

   ∠A

PG.215 IN YOUR BOOK

3. Consider the side lengths and angle measures of a right triangle.

a. Draw a right scalene triangle. Measure each interior angle and label the angle measures in your diagram.

A

Shortest side *b*

longest side

C *a* *B*

b. Measure each side length of the triangle. Label the side lengths in your diagram.

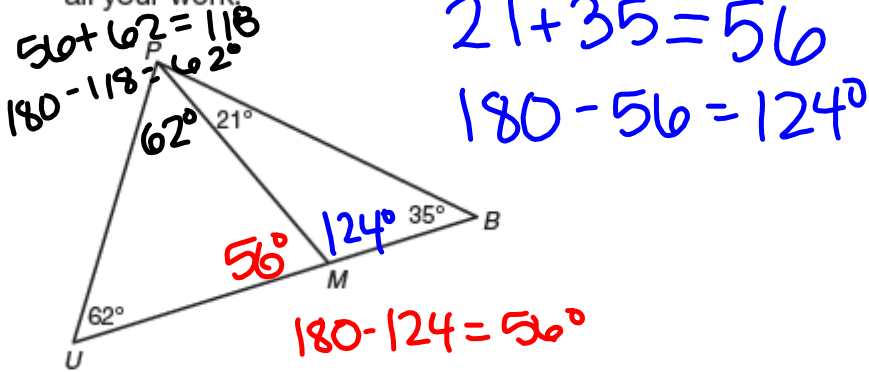c. Which interior angle lies opposite the longest side of the triangle?

∠C

d. Which interior angle lies opposite the shortest side of the triangle?

∠B

NOT IN YOUR BOOK

1. Determine the measure of angle *UPM* in the figure shown. Explain your reasoning and show all your work.

$56 + 62 = 118$

$180 - 118 = 62°$

$21 + 35 = 56$

$180 - 56 = 124°$

$62°$ $21°$

$56°$ $124°$ $35°$ B

M

$62°$

U

$180 - 124 = 56°$

2. In the figure shown, $\overrightarrow{AB}$ is parallel to $\overrightarrow{DE}$. Determine the measure of each missing angle in the figure.

B $60°$ $120°$

120 $60°$

$110°$

$70 \cdot$ $\cdot 70°$

$110°$

$50°$

$40°$ $30°$ $150°$

$30°$ A

$90°$ $60°$

E
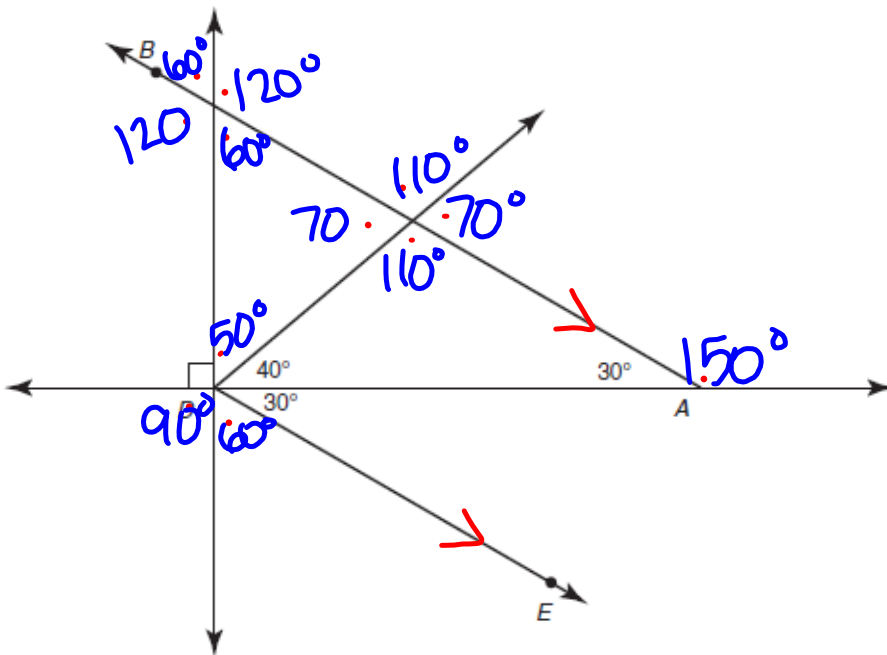
<div align="center" style="color:blue">NOT IN YOUR BOOK</div>

3. You are building a triangular play area for your new puppy. You decide that the play area will have angle measures of 50° and 40° as shown.

B
shortest side c
90°
a
longest side
40° C
A
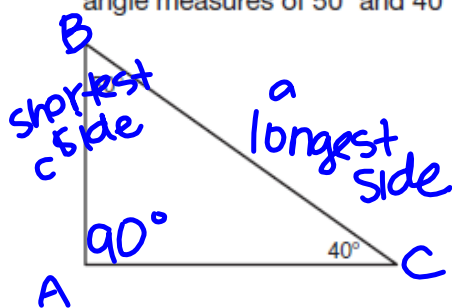
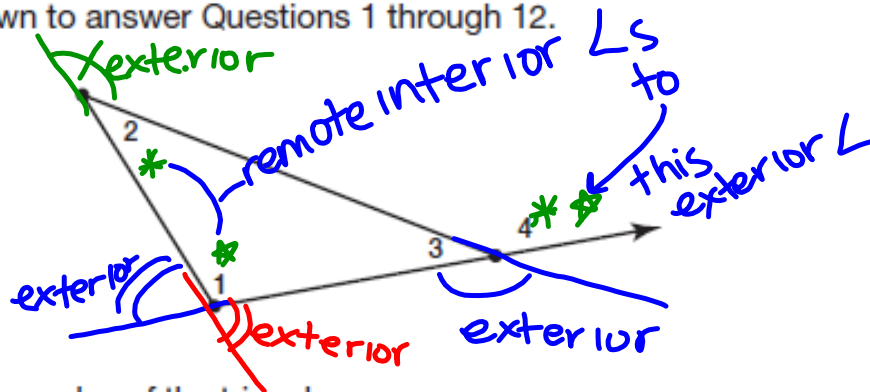   a. Which side of the play area is the longest?

   $\overline{BC}$ or a

   b. Which side of the play area is the shortest?

   $\overline{AB}$ or c

   c. Explain how you determined your answers in parts (a) and (b).

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PG.217-18 IN YOUR BOOK

Use the diagram shown to answer Questions 1 through 12.

exterior — *remote interior $\angle$s to this exterior $\angle$*

exterior — *exterior* — *exterior*

1. Name the interior angles of the triangle.

$$\angle 1, \angle 2, \angle 3$$

2. Name the exterior angles of the triangle.

$$\angle 4$$

3. What did you need to know to answer Questions 1 and 2?

4. What does $m\angle 1 + m\angle 2 + m\angle 3 = 180$? Explain your reasoning.

$$180°$$

5. What does $m\angle 3 + m\angle 4 = 180$? Explain your reasoning.

$$180°$$

6. Why does $m\angle 1 + m\angle 2 = m\angle 4$? Explain your reasoning.

$$m\angle 1 + m\angle 2 + m\angle 3 = m\angle 3 + m\angle 4$$
$$\underline{-m\angle 3 \qquad -m\angle 3}$$
$$m\angle 1 + m\angle 2 = m\angle 4$$

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PG.219 IN YOUR BOOK

The **remote interior angles of a triangle** are the two angles that are non-adjacent to the specified exterior angle.

9. Write a sentence explaining $m\angle 4 = m\angle 1 + m\angle 2$ using the words *sum*, *remote interior angles of a triangle*, and *exterior angle of a triangle*.
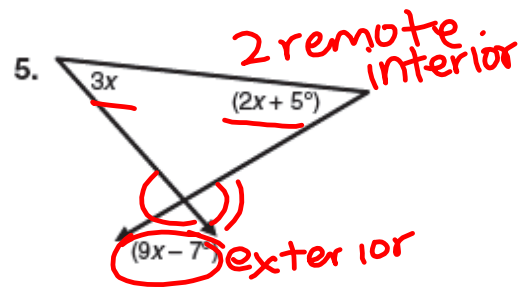
pg 220

The **Exterior Angle Theorem** states: "the measure of the exterior angle of a triangle is equal to the sum of the measures of the two remote interior angles of the triangle."

NOT IN YOUR BOOK

Solve for *x*.

4.

95°

exterior

$(5x - 1°)$

$(8x + 5°)$ 2 remote interior ∠s
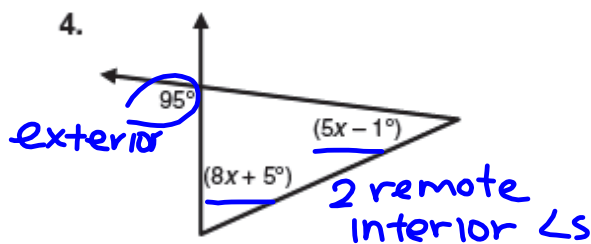
$8x + 5 + 5x - 1 = 95$

$13x + 4 = 95$

$\quad\quad -4 \quad -4$

$13x = 91$

$\dfrac{13x}{13} = \dfrac{91}{13}$

$x = 7$

5.

$3x$ 2 remote interior

$(2x + 5°)$

$(9x - 7°)$ exterior

$180 - (9x - 7) = 3x + 2x + 5$

$180 - 9x + 7 = 5x + 5$

$187 - 9x = 5x + 5$

$\quad\quad -5x \quad -5x$

$187 - 14x = 5$

$-187 \quad\quad\quad -187$

$-14x = -182$

$\dfrac{-14x}{-14} = \dfrac{-182}{-14}$

$x = 13$

The **Exterior Angle Inequality Theorem** states: "the measure of an exterior angle of a triangle is greater than the measure of either of the remote interior angles of the triangle."

SKIP PROBLEM 4: EASTER ISLAND ON PGS.224-226 IN YOUR BOOK

Sep 29-8:51 AM

Homework
Finish 3.1