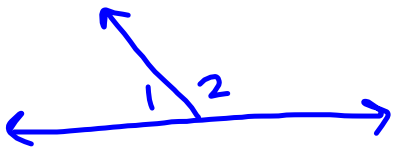
Questions on lesson 2.2?

Look over Lesson 2.2's homework,

we will be taking our content

mastery quiz soon!

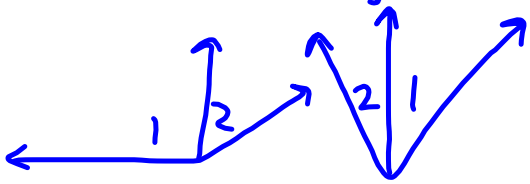
linear pair



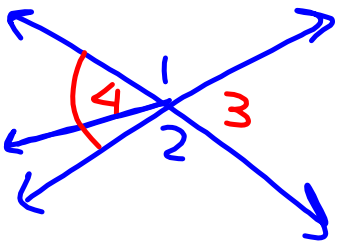
complementary = 90°

supplementary = 180°

adjacent ∠s

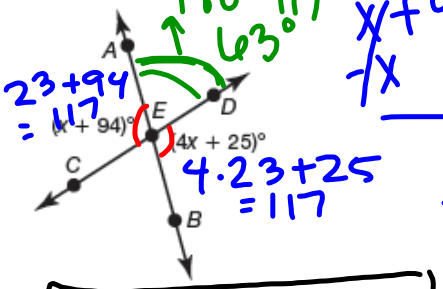


vertical ∠s



PG. 146 IN YOUR BOOK

4. Determine $m\angle AED$. Explain how you determined the angle measure.



180 - 117 = 63°

23 + 94 = 117

4·23 + 25 = 117

$x + 94 = 4x + 25$

$-x \quad -x$

$94 = 3x + 25$

$-25 \quad -25$

$\frac{69}{3} = \frac{3x}{3}$

$23 = x$

$m\angle AED = 63°$

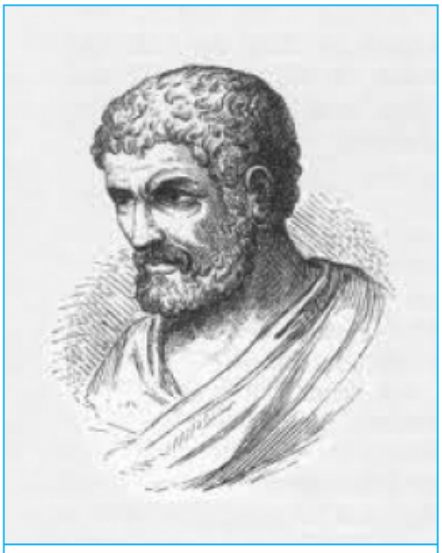
PG. 148 IN YOUR BOOK

A **postulate** is a statement that is accepted without proof.

A **theorem** is a statement that can be proven.

The Elements is a book written by the Greek mathematician Euclid. He used a small number of undefined terms and postulates to systematically prove many theorems. As a result, Euclid was able to develop a complete system we now know as **Euclidean geometry**.

Euclidean geometry



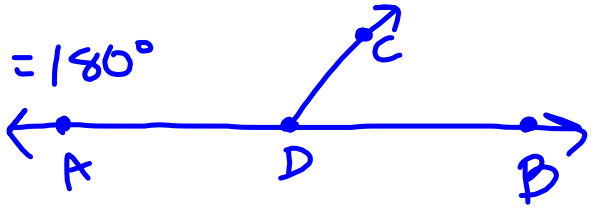
Greek mathematician Euclid is sometimes referred to as the Father of Geometry.

For each of these postulates, sketch a picture in your text, that is a question for your homework

PG. 150 IN YOUR BOOK

The **Linear Pair Postulate** states: "If two angles form a linear pair, then the angles are supplementary."

$m\angle ADC + m\angle CDB = 180°$



PG. 151 IN YOUR BOOK

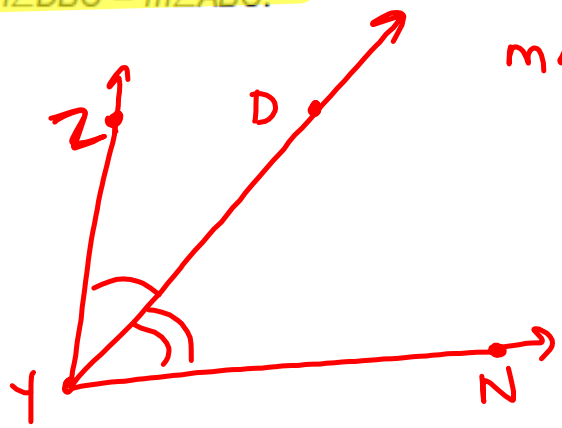
The **Segment Addition Postulate** states: "If point B is on $\overline{AC}$ and between points A and C, then $AB + BC = AC$."

$PQ + QR = PR$

$m\overline{PQ} + m\overline{QR} = m\overline{PR}$

PG. 152 IN YOUR BOOK

The **Angle Addition Postulate** states: "If point D lies in the interior of $\angle ABC$, then $m\angle ABD + m\angle DBC = m\angle ABC$."



$m\angle ZYD + m\angle DYN = m\angle ZYN$

Forms of Proof

2.3

Paragraph Proof, Two-Column Proof, Construction Proof, and Flow Chart Proof

PG. 153-4 IN YOUR BOOK

PROBLEM 1 **Properties of Real Numbers in Geometry**

Many properties of real numbers can be applied in geometry. These properties are important when making conjectures and proving new theorems.

The **Addition Property of Equality** states: "If a, b, and c are real numbers and $a = b$, then $a + c = b + c$."

$x - 3 = 7$
$+3 \quad +3$
$x = 10$

The Addition Property of Equality can be applied to angle measures, segment measures, and distances.

Angle measures:

If $m\angle 1 = m\angle 2$, then $m\angle 1 + m\angle 3 = m\angle 2 + m\angle 3$.

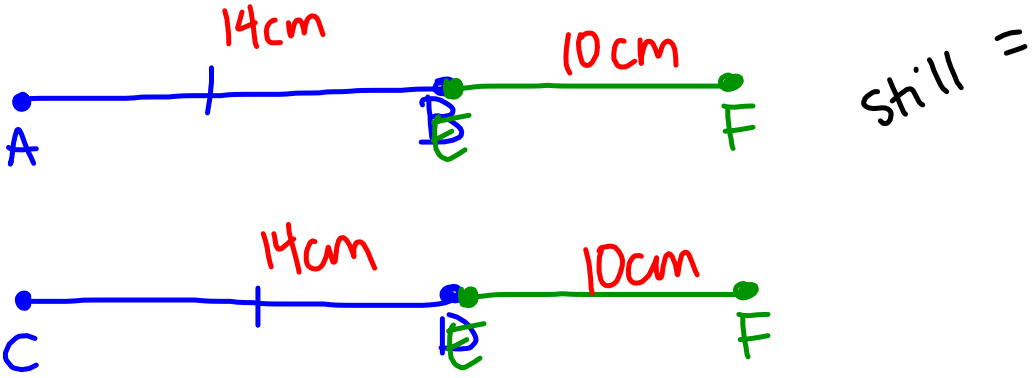
Segment measures:

If $m\overline{AB} = m\overline{CD}$, then $m\overline{AB} + m\overline{EF} = m\overline{CD} + m\overline{EF}$. *

Distances:

If $AB = CD$, then $AE + EF = CD + EF$.

2. Sketch a diagram and write a statement that applies the Addition Property of Equality to segment measures.



PG. 155 IN YOUR BOOK

The **Subtraction Property of Equality** states: "If a, b, and c are real numbers and $a = b$, then $a - c = b - c$."

The Subtraction Property of Equality can be applied to angle measures, segment measures, and distances.

$3x+4=10$
$-4 \quad -4$
$3x=6$

* Angle measures:

If $m\angle 1 = m\angle 2$, then $m\angle 1 - m\angle 3 = m\angle 2 - m\angle 3$

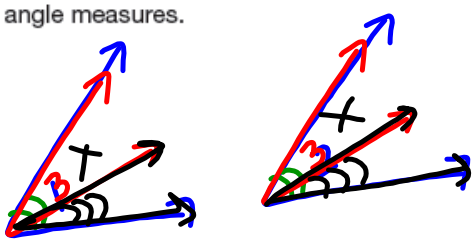
Segment measures:

If $m\overline{AB} = m\overline{CD}$, then $m\overline{AB} - m\overline{EF} = m\overline{CD} - m\overline{EF}$

Distances:

If $AB = CD$, then $AB - EF = CD - EF$.

3. Sketch a diagram and write a statement that applies the Subtraction Property of Equality to angle measures.



PG. 156 IN YOUR BOOK

The **Reflexive Property** states: "If a is a real number, then $a = a$."

The Reflexive Property can be applied to angle measures, segment measures, distances, congruent angles, and congruent segments.

Angle measures:

$m\angle 1 = m\angle 1$

Segment measures:

$m\overline{AB} = m\overline{AB}$

Distances:

$AB = AB$

Congruent angles:

$\angle 1 \cong \angle 1$

Congruent segments:

$\overline{AB} \cong \overline{AB}$

5. Sketch a diagram and write a statement that applies the Reflexive Property to angles.

Sep 14-9:16 AM

PG. 157 IN YOUR BOOK

The **Substitution Property** states: "If a and b are real numbers and $a = b$, then a can be substituted for b."

The Substitution Property can be applied to angle measures, segment measures, and distances.

$x + 1 = 3$
$-1 \quad -1$
$x = 2$

$\begin{cases} y = 5x + 1 \\ y = x + 3 \end{cases}$
$5x + 1 = x + 3$

$2 + 1 = 3$
$3 = 3$

Angle measures:

If $m\angle 1 = 56°$ and $m\angle 2 = 56°$, then $m\angle 1 = m\angle 2$.

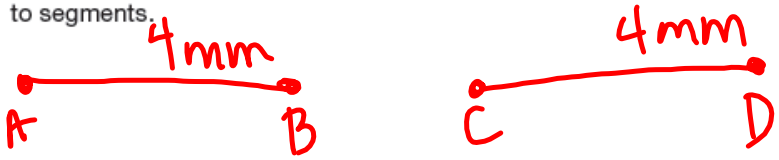
Segment measures:

If $m\overline{AB} = 4$ mm and $m\overline{CD} = 4$ mm, then $m\overline{AB} = m\overline{CD}$.

Distances:

If $AB = 12$ ft and $CD = 12$ ft, then $AB = CD$.

8. Sketch a diagram and write a statement that applies the Substitution Property to segments.



PG. 158 IN YOUR BOOK

The **Transitive Property** states: "If a, b, and c are real numbers, $a = b$, and $b = c$, then $a = c$."

If $x = 7$ and $7 = 2 + 5$, then $x = 2 + 5$

The Transitive Property can be applied to angle measures, segment measures, distances, congruent angles, and congruent segments.

Angle measures:

If $m\angle 1 = m\angle 2$ and $m\angle 2 = m\angle 3$, then $m\angle 1 = m\angle 3$.

Segment measures:

If $m\overline{AB} = m\overline{CD}$ and $m\overline{CD} = m\overline{EF}$, then $m\overline{AB} = m\overline{EF}$.

Distances:

If $AB = CD$ and $CD = EF$, then $AB = EF$.

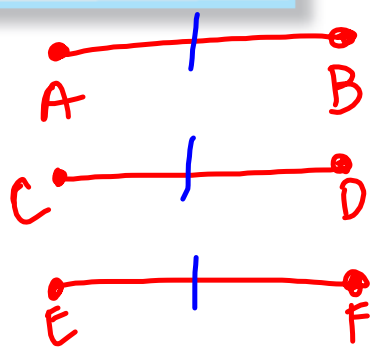
Congruent angles:

If $\angle 1 \cong \angle 2$ and $\angle 2 \cong \angle 3$, then $\angle 1 \cong \angle 3$.

Congruent segments:

If $\overline{AB} \cong \overline{CD}$ and $\overline{CD} \cong \overline{EF}$, then $\overline{AB} \cong \overline{EF}$.

10. Sketch a diagram and write a statement that applies the Transitive Property to congruent segments.



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PG. 159 IN YOUR BOOK

PROBLEM 2 Various Forms of Proof

A proof is a logical series of statements and corresponding reasons that starts with a hypothesis and arrives at a conclusion. In this course, you will use four different kinds of proof.

1. The diagram shows four collinear points A, B, C, and D such that point B lies between points A and C, point C lies between points B and D, and $\overline{AB} \cong \overline{CD}$.

G P

Consider the conditional statement: If $\overline{AB} \cong \overline{CD}$, then $\overline{AC} \cong \overline{BD}$.

a. Write the hypothesis as the "Given" and the conclusion as the "Prove."

Given: $\overline{AB} \cong \overline{CD}$

Prove: $\overline{AC} \cong \overline{BD}$

A flow chart proof is a proof in which the steps and reasons for each step are written in boxes. Arrows connect the boxes and indicate how each step and reason is generated from one or more other steps and reasons.

SKIP b/c on pg. 159-161

*YOU CAN SKIP PGS. 159-161 IN YOUR BOOK FOR HOMEWORK

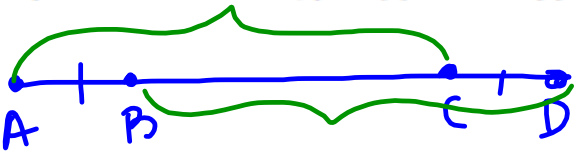
PG. 162 IN YOUR BOOK

A two-column proof is a proof in which the steps are written in the left column and the corresponding reasons are written in the right column. Each step and corresponding reason are numbered.

d. Create a two-column proof of the conditional statement in Question 1. Each box of the flow chart proof in Question 1, part (c) should appear as a row in the two-column proof.

Given: $\overline{AB} \cong \overline{CD}$

Prove: $\overline{AC} \cong \overline{BD}$



Given is ALWAYS first

Statements	Reasons
1. $\overline{AB} \cong \overline{CD}$	1. Given
2. $m\overline{AB} = m\overline{CD}$	2. Definition of congruent segments
3. $m\overline{BC} = m\overline{BC}$	3. Reflexive Property
4. $m\overline{AB} + m\overline{BC} = m\overline{CD} + m\overline{BC}$	4. Addition Property of Equality
5. $m\overline{AB} + m\overline{BC} = m\overline{AC}$	5. Segment Addition Postulate
6. $m\overline{CD} + m\overline{BC} = m\overline{BD}$	6. Segment Addition Postulate
7. $m\overline{AC} = m\overline{BD}$	7. Substitution Property
8. $\overline{AC} \cong \overline{BD}$	8. Definition of congruent segments

Prove is last

PG. 162 IN YOUR BOOK

A **paragraph proof** is a proof in which the steps and corresponding reasons are written in complete sentences.

e. Write a paragraph proof of the conditional statement in Question 1. Each row of the two-column proof in Question 1, part (d) should appear as a sentence in the paragraph proof.

PG. 163 IN YOUR BOOK

A **construction proof** is a proof that results from creating an object with specific properties using only a compass and a straightedge.

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Homework

The rest of lesson 2.3 is homework through page 173. You may write paragraph and two column proofs instead of flow chart or construction proofs.

*If I were you, I'd practice writing a few different proofs, like 3-5 proofs, not every single proof given in the book.

Aug 24-2:00 PM