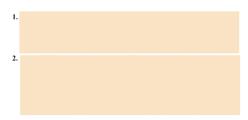
REVIEW OF TERMS AND CONNECTIONS

WORDS You Need to Communicate Effectively 1. Match each term with one shape. a) scalene triangle b) isosceles triangle c) equilateral triangle d) right triangle e) acute triangle f) obtuse triangle g) quadrilateral h) trapezoid i) parallelogramj) rhombusk) rectangle I) square

- Draw a diagram to illustrate each term.
 a) parallel lines
 b) perpendicular lines

 - c) supplementary angles

Answers



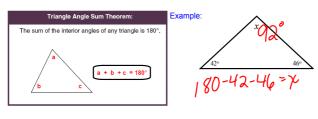
Notes - Geometry Theorems.doc

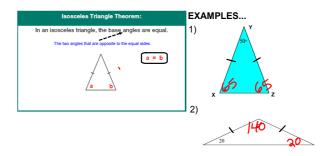
*** Now that the notes are taken care of...

REVIEW??? GMF 10 - Angle Properties

We better do some examples to $\underline{\text{UNDERSTAND}}$ these BIG ideas!!!

Geometry Theorems...





• Complementary Angles:

Two or more angles that have a sum of 90°.

Examples:

(1) What is the complement of a 50° angle?

(2) Determine the measure of the missing angle.



• Supplementary Angles:

Two or more angles that have a sum of 180°.

Examples:



Opposite Angle Theorem...

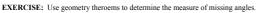
When 2 straight lines cross, 2 pairs of opposite angles are formed. Opposite angles are equal in size

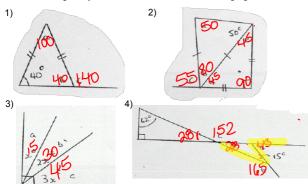


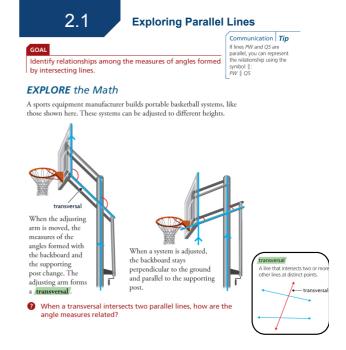
In geometry, angles or lines marked with the same symbol are the same size.

Example:









Parallel Line Theorems

A transversal is a third line that crosses two or more lines, as shown in the illustration to the right.

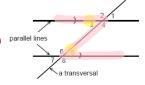
Corresponding Angles:

Pairs of angles on the same side of a transversal and the same side of the parallel lines

CORRESPONDING ANGLES ARE EQUAL

Alternate Interior Angles:

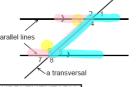
Pairs of angles on the opposite sides of a transversal and between parallel lines



ALTERNATE INTERIOR ANGLES ARE EQUAL

Co-Interior Angles (Same-side Interior):

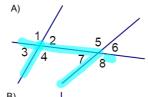
Pairs of angles on the same side of a transversal and between the parallel lines



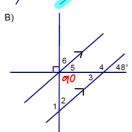
a transversal

CO-INTERIOR ANGLES ARE SUPPLEMENTARY

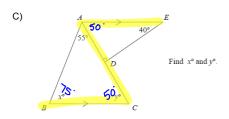
EXERCISE: Practice...

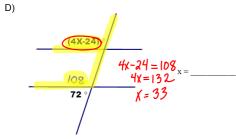


- <3 and < ____ are corresponding angles.
- 2. <4 and <____ are alternate interior angles
- <5 and < ____ are same-side interior angles.









Homework...

p. 72: #2

p. 78: #1, 4, 15

Geometric Proofs... The 'Two-Column Proof'

Key Terms (in your notes)...

deductive reasoning Drawing a specific conclusion

through logical reasoning by starting with general assumptions that are known to be valid.

A mathematical argument showing that a statement is valid in all cases, or that no counterexample exists.

transitive property

If two quantities are equal to the same quantity, then they are equal to each other. If a = b and b = c, then a = b

two-column proof

A presentation of a logical argument involving deductive reasoning in which the statements of the argument are written in one column and the justifications for the statements are written in the other column.

STATEMENT JUSTIFICATION

***ADD this one to your notes...

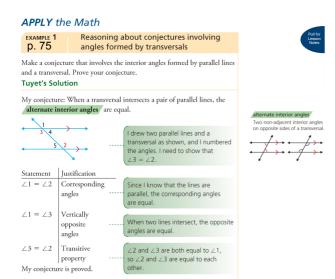
A statement that is formed by switching the premise and the conclusion of another statement.

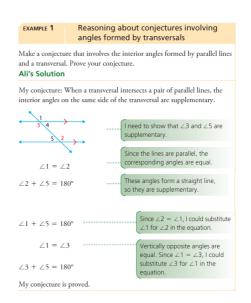
EXAMPLES...

Conjecture: If it is raining outside, then the grass is wet.

CONVERSE: If the grass is wet, then it is raining.

THEOREM: If you have parallel lines, then the corresponding angles are equal. CONVERSE: If the corresponding angles are equal, then the lines are parallel.





Reasoning about conjectures involving angles formed by transversals

Make a conjecture that involves the interior angles formed by parallel lines and a transversal. Prove your conjecture.

Your Turn

Naveen made the following conjecture: "Alternate exterior angles are equal." Prove Naveen's conjecture.

Answer

alternate exterior angles Two exterior angles formed between two lines and a transversal, on opposite sides of the transversal. Example #2:

In $\triangle EFG$, GI bisects $\angle FGH$ a) If $\angle E = \angle y$, then prove that $EF \parallel GI$ $\angle y = \angle Z$ $\angle z = \angle Z$ $z = \angle Z$ z

b) If $\angle F = \angle z$, then prove that $EF \parallel GI$

p. 77 EXAMPLE 3 Using angle properties to prove that lines are parallel

One side of a cellphone tower will be built as shown. Use the angle measures to prove that braces *CG*, *BF*, and *AE* are parallel.



Morteza's Solution: Using corresponding angles



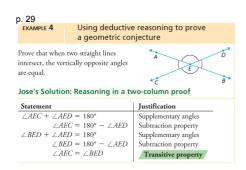
EXAMPLE 3 Using angle properties to prove that lines are parallel

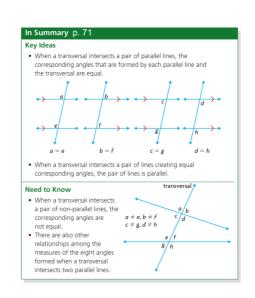
One side of a cellphone tower will be built as shown. Use the angle measures to prove that braces *CG*, *BF*, and *AE* are parallel.

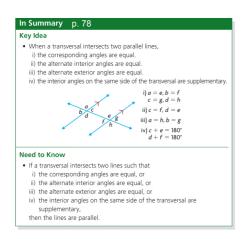


Jennifer's Solution: Using alternate interior angles

•		
Statement	Justification	
$\angle CGB = 35^{\circ} \text{ and } \angle GBF = 35^{\circ}$ $CG \parallel BF$	Given Alternate interior angles	When alternate interior angles are equal, the lines are parallel.
$\angle FBE = 22^{\circ} \text{ and } \angle BEA = 22^{\circ}$ $BF \parallel AE$	Given Alternate interior angles	When alternate interior angles are equal, the lines are parallel.
CG BF and BF AE	Transitive property	Since CG and AE are both parallel to BF, they must also be parallel to each other.







Homework...

p. 72: #4-6

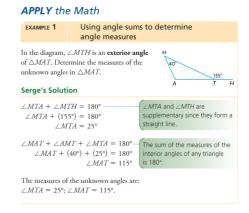
p. 78: #2, 8, 10, 12, 20



Construct a triangle with paper...

- tear off the angles and line them up!

CONJECTURE

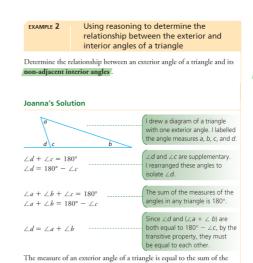


Your Turn

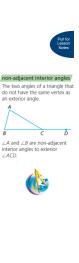
If you are given one interior angle and one exterior angle of a triangle, can you always determine the other interior angles of the triangle? Explain, using diagrams.

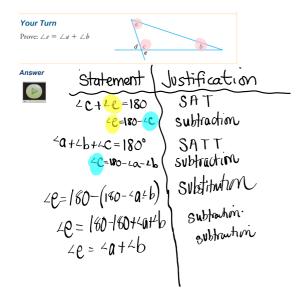
Answer





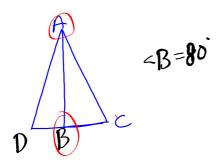
measures of the two non-adjacent interior angles.

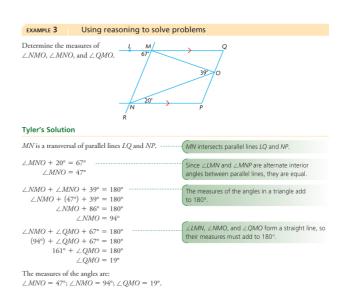


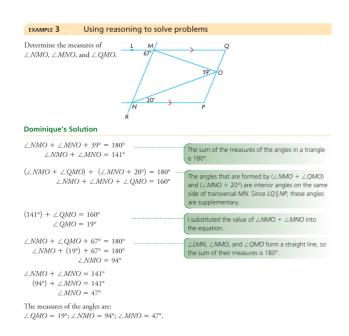


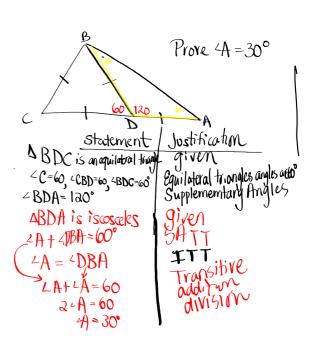
if
$$a=b$$

given $a=7$
 $b=?$ transitive









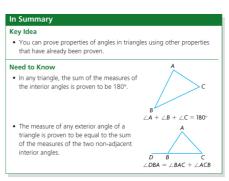
Page 80. #10,12,15,16

Your Turn

In the diagram for Example 3, $QP \parallel MR$. Determine the measures of $\triangle MQO, \triangle MOQ, \triangle NOP, \triangle OPN$, and $\triangle RNP$.

Answer





HW... Section 2.3: #1 - 13

Homework (from yesterday)...

p. 72: #4-6

#- parallel __ per pendimlar (91°)

p. 78: #2, 8, 10, 12, 20

p. 90: #3, 5, 7, 9, 13 [from today's lesson]

2.4

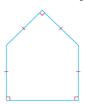
Angle Properties in Polygons

GOA

Determine properties of angles in polygons, and use these properties to solve problems.

EXPLORE.

 A pentagon has three right angles and four sides of equal length, as shown. What is the sum of the measures of the angles in the pentagon?



SAMPLE ANSWER

I drew a diagonal joining the two angles that are not right angles. This cut the pentagon into a rectangle and a triangle. I knew that the quadrilateral was a rectangle, not a trapezoid, because the two right angles share an arm, so their other arms must be parallel. As well, the other arms are equal length. I knew that the sum of the measures of the angles in a rectangle is 360° and the sum of the measures of the angles in a triangle is 180° , so the sum of the measures of the angles in the pentagon must be 540° .



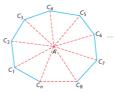
APPLY the Math Deriving the formula...

EXAMPLE 1

Reasoning about the sum of the interior angles of a polygon

Prove that the sum of the measures of the interior angles of any *n*-sided **convex polygon** can be expressed as $180^{\circ}(n-2)$.

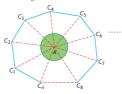
Viktor's Solution



I drew an *n*-sided polygon. I represented the *n*th side using a broken line. I selected a point in the interior of the polygon and then drew line segments from this point to each vertex of the polygon. The polygon is now separated into *n* triangles.

The sum of the measures of the angles in each triangle is 180°.

The sum of the measures of the angles in n triangles is $n(180^{\circ})$.



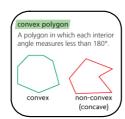
Two angles in each triangle combine with angles in the adjacent triangles to form two interior angles of the polygon.

Each triangle also has an angle at vertex A. The sum of the measures of the angles at A is 360° because these angles make up a complete rotation. These angles do not contribute to the sum of the interior angles of the polygon.

The sum of the measures of the interior angles of the polygon, S(n), where n is the number of sides of the polygon, can be expressed as:

 $S(n) = 180^{\circ}n - 360^{\circ}$ $S(n) = 180^{\circ}(n-2)$

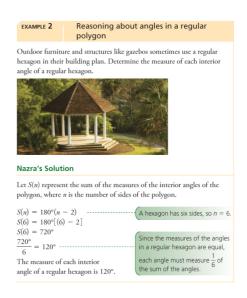
The sum of the measures of the interior angles of a convex polygon can be expressed as $180^{\circ}(n-2)$.

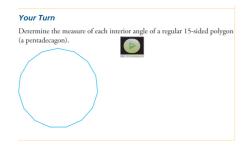


This is my conjecture: The sum of the measures of the interior angles in a polygon, S(n), is:

 $S(n) = 180^{\circ}(n-2)$

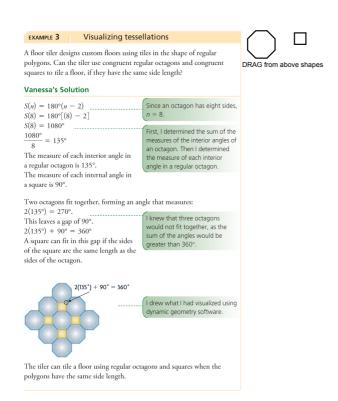
Regular Polygon → all angles / sides are equal Equilateral Square Pentagon Triangle Hexagon Octagon





Tiling Using Regular Polygons...

Regular Polygon	Measure of Interior Angle (degrees)
Equilateral Triangle	60
Square	90
Pentagon	108
Hexagon	120
Heptagon (7 sided)	128.3
Octagon	135
Nonagon (9 sided)	140
Decagon (10 sided)	144





Can a tiling pattern be created using regular hexagons and equilateral triangles that have the same side length? Explain.

Answei



In Summary

Key Idea

You can prove properties of angles in polygons using other angle properties that have already been proved.

- The sum of the measures of the interior angles of a convex polygon with n sides can be expressed as $180^{\circ}(n-2)$.
- The measure of each interior angle of a regular polygon is $\frac{180^{\circ}(n-2)}{c}$
- The sum of the measures of the exterior angles of any convex polygon

HOMEWORK...

Page 99: 1, 3, 4, 5, 10, 11, 16 HISTORY on Buckyball Do A, B and C

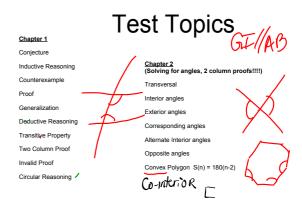
WARM-UP...

3) Think of a number
With the number in mind, do the following operations:

⇔ double it
⇔ add 4
⇔ half it
⇔ subtract 2
What is your answer?

Inductively:

Deductively:



UNIT TEST... Chp. 1 - Inductive/Deductive

Chp. 2 - Angle Properties

REVIEW / PRACTICE TIME...

CHAPTER 1...

p. 34: Mid Chp Review (FAQ)

p. 35: Mid Chp Practice Ques.

p. 59: Chp Review (FAQ)

p. 61: Chp Practice (omit 1.7)

p. 58: Practice Test

CHAPTER 2...

p. 84: Mid Chp Review (FAQ)

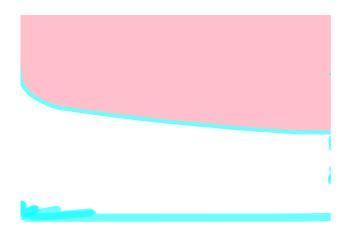
p. 85: Mid Chp Practice Ques.

p. 105: Chp Review (FAQ)

p. 106: Chp Practice

p. 104: Practice Test





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PM11-2s2.gsp

2s2e1 final.mp4

PM11-2s2-review.gsp

2s3e1 finalt.mp4

PM11-2s3-2.gsp

2s3e2 finalt.mp4

2s3e3 finalt2.mp4

PM11-2s4-interior.gsp

PM11-2s4-exterior.gsp

2s4e1 finalt.mp4

2s4e2 finalt.mp4

2s4e3 finalt.mp4

Notes - Geometry Theorems.doc

Worksheet - Parallel Lines and Transversals.pdf

PM11-1s4.gsp