Homework... Questions ?

p. 72: #2, 4-6

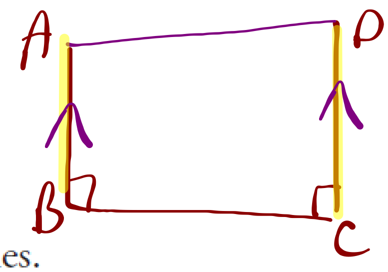
p. 78: #1, 2, 4, 8, 10, 12, 15, 20

8. a) Joshua made the following conjecture: "If $AB \perp BC$ and $BC \perp CD$, then $AB \perp CD$." Identify the error in his reasoning.

perpendicular

Joshua's Proof

Statement	Justification
$AB \perp BC$	Given
$BC \perp CD$	Given
$\cancel{AB \perp CD}$	~~Transitive property~~
$AB \parallel CD$	CIA



b) Make a correct conjecture about perpendicular lines.

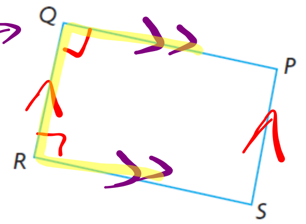
10. Jason wrote the following proof.
Identify his errors, and correct his proof.

Given: $QP \perp QR$

$QR \perp RS$

$QR \parallel PS$

Prove: $QPSR$ is a parallelogram.



Jason's Proof

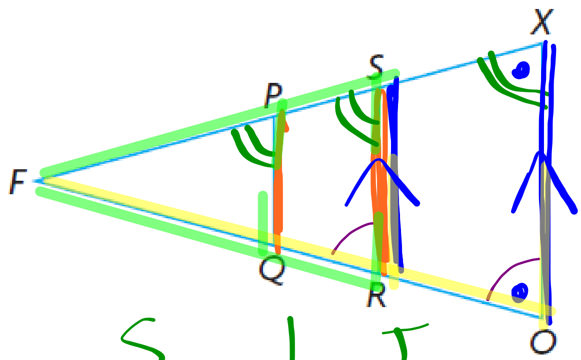
Statement	Justification
$\angle PQR = 90°$ and $\angle QRS = 90°$	Lines that are perpendicular meet at right angles.
$QP \parallel RS$	Since the interior angles on the same side of a transversal are ~~equal~~ supplementary, QP and RS are parallel.
$QR \parallel PS$	Given
$QPSR$ is a parallelogram	$QPSR$ has two pairs of parallel sides.

12. Given: $\triangle FOX$ is isosceles.

$\angle FOX = \angle FRS$

$\angle FXO = \angle FPQ$

Prove: a) $PQ \parallel SR$ and b) $SR \parallel XO$



b)

S	J
$\angle FRS = \angle FOX$	Given
$\therefore SR \parallel XO$	CA

a)

S	J
$\angle FSR = \angle FXO$	CA
$\angle FPQ = \angle FXO$	Given
$\angle FSR = \angle FPQ$	Transitive
$\therefore PQ \parallel SR$	CA

2.3 Angle Properties in Triangles

GOAL

Prove properties of angles in triangles, and use these properties to solve problems.

Construct a triangle with paper...

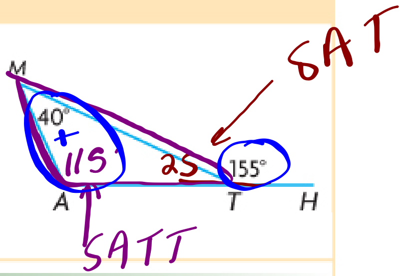
- tear off the angles and line them up!

CONJECTURE

APPLY the Math

EXAMPLE 1 Using angle sums to determine angle measures

In the diagram, $\angle MTH$ is an **exterior angle** of $\triangle MAT$. Determine the measures of the unknown angles in $\triangle MAT$.



Serge's Solution

$$\angle MTA + \angle MTH = 180°$$
$$\angle MTA + (155°) = 180°$$
$$\angle MTA = 25°$$

$\angle MTA$ and $\angle MTH$ are supplementary since they form a straight line.

$$\angle MAT + \angle AMT + \angle MTA = 180°$$
$$\angle MAT + (40°) + (25°) = 180°$$
$$\angle MAT = 115°$$

The sum of the measures of the interior angles of any triangle is 180°.

The measures of the unknown angles are:
$\angle MTA = 25°$; $\angle MAT = 115°$.

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

EXAMPLE 2 p 88

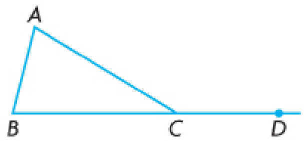
Using reasoning to determine the relationship between the exterior and interior angles of a triangle

Pull for Lesson Notes

Determine the relationship between an exterior angle of a triangle and its **non-adjacent interior angles**.

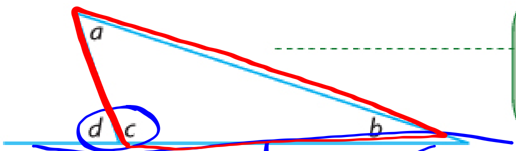
Prove: $\angle d = \angle a + \angle b$

non-adjacent interior angles
The two angles of a triangle that do not have the same vertex as an exterior angle.



$\angle A$ and $\angle B$ are non-adjacent interior angles to exterior $\angle ACD$.

Joanna's Solution



I drew a diagram of a triangle with one exterior angle. I labelled the angle measures *a*, *b*, *c*, and *d*.

$\angle d + \angle c = 180°$
$\angle d = 180° - \angle c$

SAT Subtraction

$\angle d$ and $\angle c$ are supplementary. I rearranged these angles to isolate $\angle d$.

$\angle a + \angle b + \angle c = 180°$
$\angle a + \angle b = 180° - \angle c$

SATT subtraction

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

$\boxed{\angle d = \angle a + \angle b}$

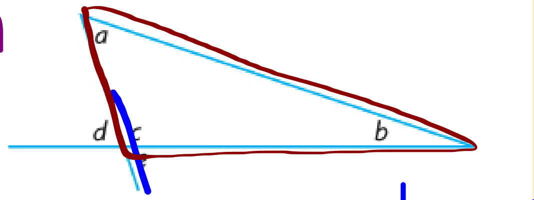
Transitive

Since $\angle d$ and ($\angle a + \angle b$) are both equal to $180° - \angle c$, by the transitive property, they must be equal to each other.

The measure of an exterior angle of a triangle is equal to the sum of the measures of the two non-adjacent interior angles.

Your Turn Conclusion

Prove: $\angle e = \angle a + \angle b$



Answer

Statement	Justification
$\angle e + \angle c = 180°$	SAT
$\angle a + \angle b + \angle c = 180°$	SATT
$\angle e + \cancel{\angle c} = \angle a + \angle b + \cancel{\angle c}$	Transitive
$\angle e = \angle a + \angle b$	

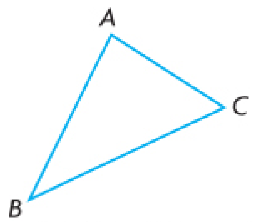
In Summary

Key Idea

- You can prove properties of angles in triangles using other properties that have already been proven.

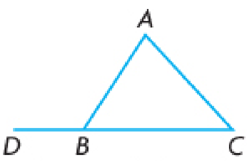
Need to Know

- In any triangle, the sum of the measures of the interior angles is proven to be 180°.



$\angle A + \angle B + \angle C = 180°$

- The measure of any exterior angle of a triangle is proven to be equal to the sum of the measures of the two non-adjacent interior angles.



$\angle DBA = \angle BAC + \angle ACB$

HW... Section 2.3: #1 - 13

p. 90

Attachments

2s3e1 finalt.mp4

PM11-2s3-2.gsp

2s3e2 finalt.mp4