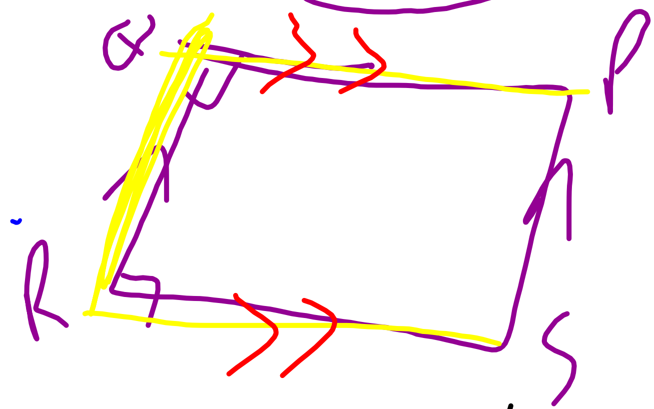
Homework...

p. 72: #4-6

15

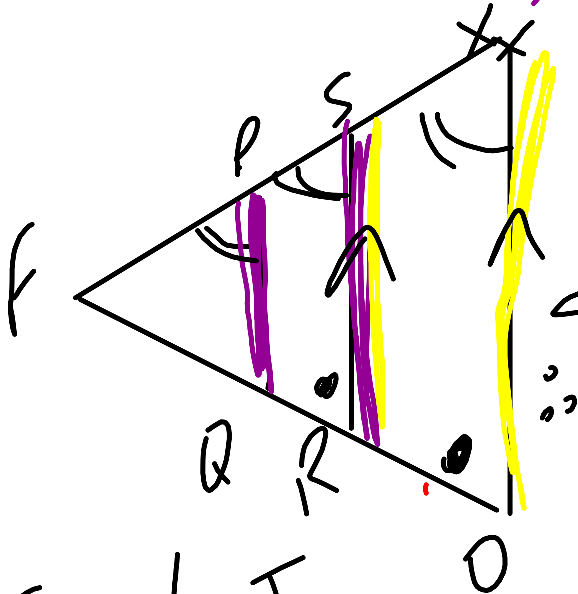
p. 78: #2, 8, 10, 12, 20

10



* 2nd ~~equal~~ supplement

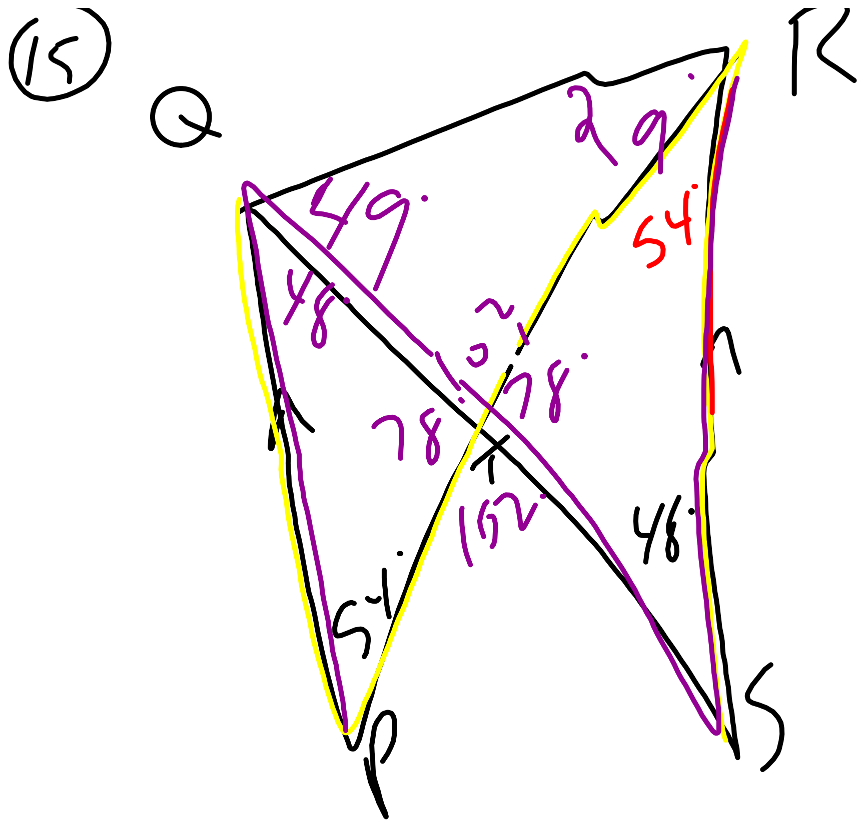
12



ΔFOX → ITT

S	J
∠FRS = ∠FOX	Given
∴ SR ∥ OX	CA

S	J
∠FSR = ∠FXO	CA
∠FPQ = ∠FXO	Given
∠FSR = ∠FPQ	Transitive
∴ PQ ∥ SR	CA


15
Q
R
P
S
T
49°
29°
54°
48
102°
78°
78°
152°
54°
48°

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!

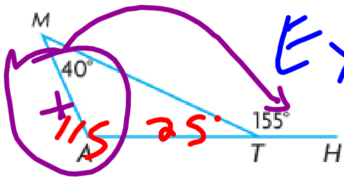
CONJECTURE

APPLY the Math

EXAMPLE 1 Using angle sums to determine angle measures

EAT

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



Exterior Angle Theorem

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.

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

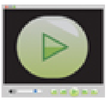
The sum of the measures of the interior angles of any triangle is 180°.

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

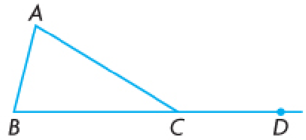


EXAMPLE 2 Using reasoning to determine the relationship between the exterior and interior angles of a triangle

Pull for Lesson Notes

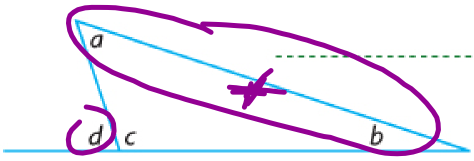
Determine the relationship between an exterior angle of a triangle and its **non-adjacent interior angles**.

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*.

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

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

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

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

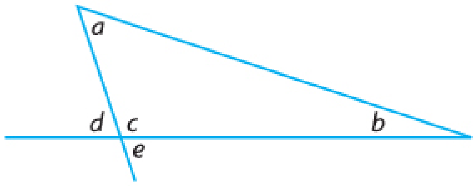
$\angle d = \angle a + \angle b$

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.

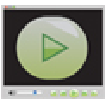
The measure of an exterior angle of a triangle is equal to the sum of the measures of the two non-adjacent interior angles.

Your Turn

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



Answer



S	J
$\angle e + \angle c = 180^\circ$	SAT
$\angle e = 180 - \angle c$	Subtraction
$\angle a + \angle b + \angle c = 180$	SATT
$\angle a + \angle b = 180 - \angle c$	
$\angle e = \angle a + \angle b$	Transitive

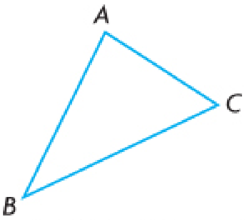
In Summary

Key Idea

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

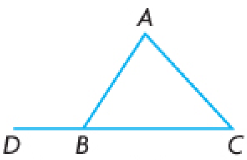
Need to Know

- 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

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Attachments

2s3e1 finalt.mp4

PM11-2s3-2.gsp

2s3e2 finalt.mp4