

What's Going On?

Checking In

Minds on

Naming Angles

Action!

iPad Investigation

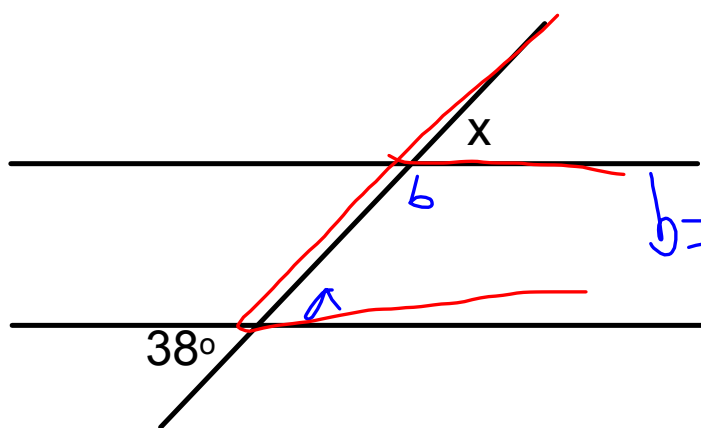
Consolidation

Exit Card

Learning Goal - I will determine the angle relationships in triangles and be able to problem solve with them .

Determine the measure of angle x .

Justify. (include all theorems used)



$$a = 38^\circ \text{ by opposite angles}$$

$$b = 142^\circ \text{ by co-interior angles}$$

$$x = 38^\circ \text{ by adjacent angles}$$

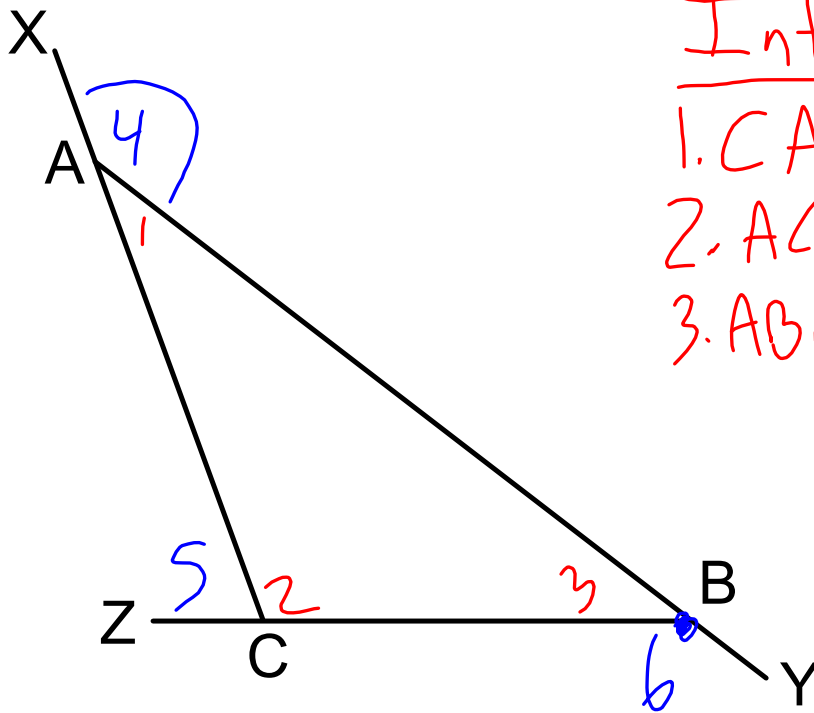
Unit 5: Geometric Relationships

Today's Topic

Angle Relationships in Triangles

Minds on

Naming Angles



Interior Angles

1. CAB or BAC
2. ACB or BCA
3. ABC or CBA

Exterior Angles

4. XAY or YAX or ...

5. ZCX or X CZ or ...

6. YBZ or ZBY or ...

Action!

iPad Investigation

Action!

What is the sum of the
angles in a triangle?

180°

Action!

What is the sum of the angles in a triangle?

180°
ALWAYS

This is actually a *theorem*... our first theorem!

The Interior Angle Theorem (**IAT**)

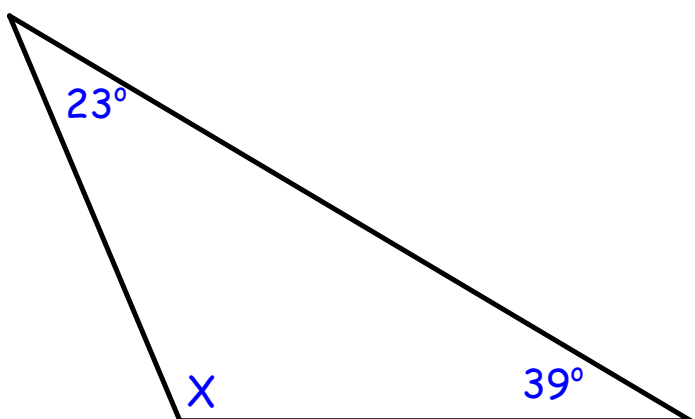
The sum of the interior angles of any triangle
is always 180°.

Action!

Theorems

Interior Angle Theorem (IAT)

Find the measure of angle X.



To find the measure of an interior angle given two interior angles:

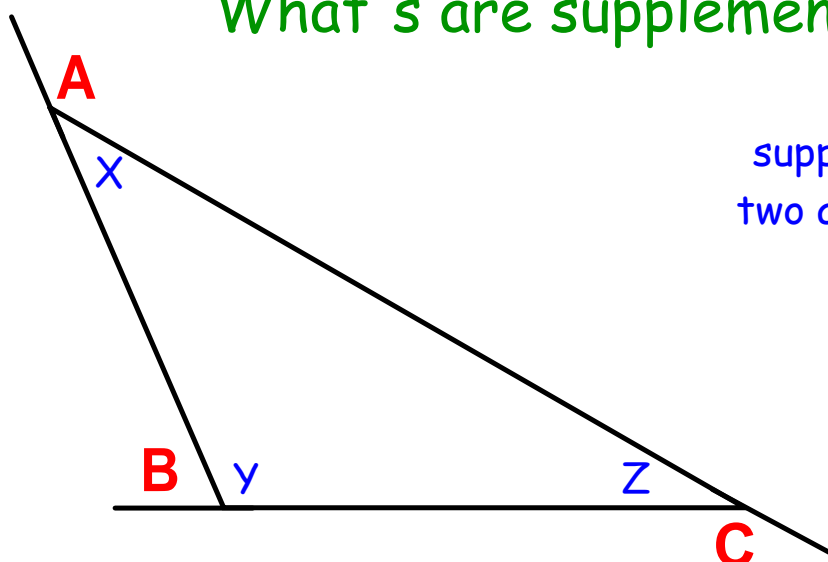
1. Start with 180° .
2. Subtract each angle.
3. What remains is the measure of the missing angle.

Action!

Theorems

Supplementary Angle Theorem (SAT)

What's are supplementary angles?



supplementary angles are
two angles that exist along
a straight line

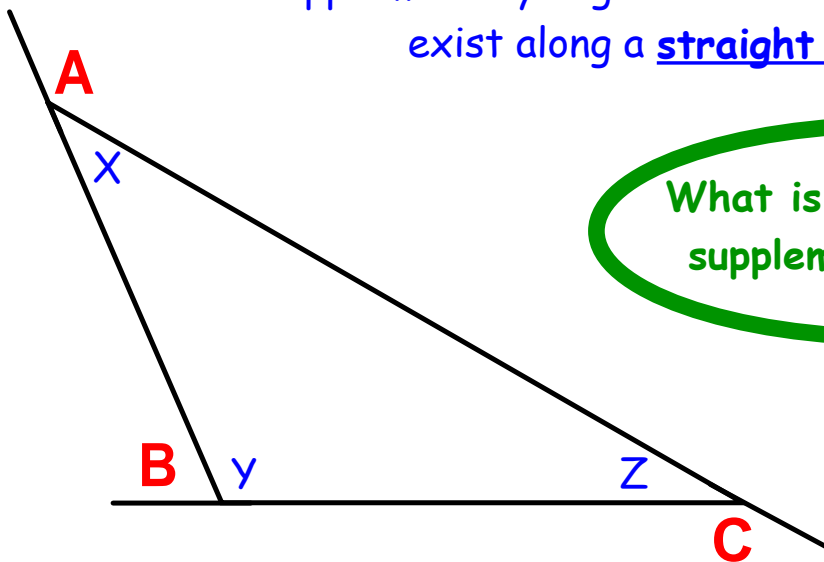
A and X
B and Y
C and Z

Action!

Theorems

Supplementary Angle Theorem (SAT)

supplementary angles are two angles that exist along a straight line



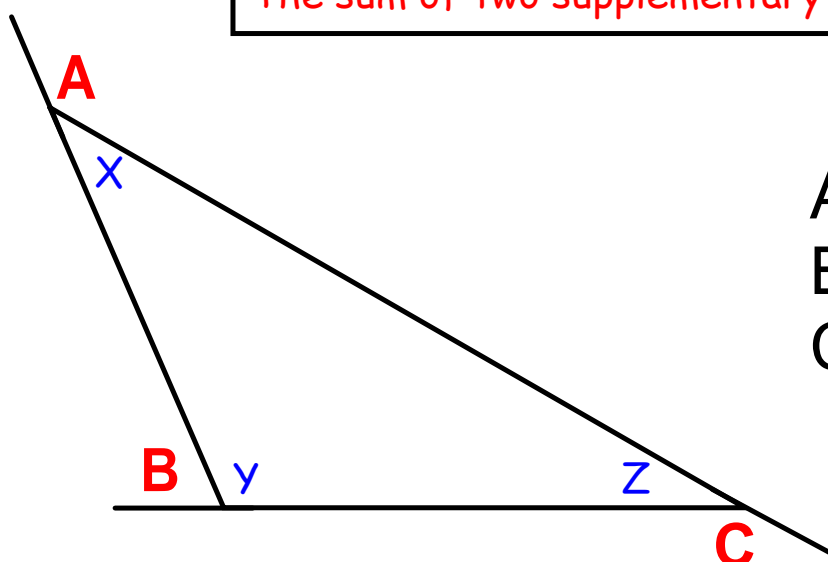
What is the sum of two supplementary angles?

Action!

Theorems

Supplementary Angle Theorem (SAT)

The sum of two supplementary angles is 180° .



$$A + X = 180^\circ$$

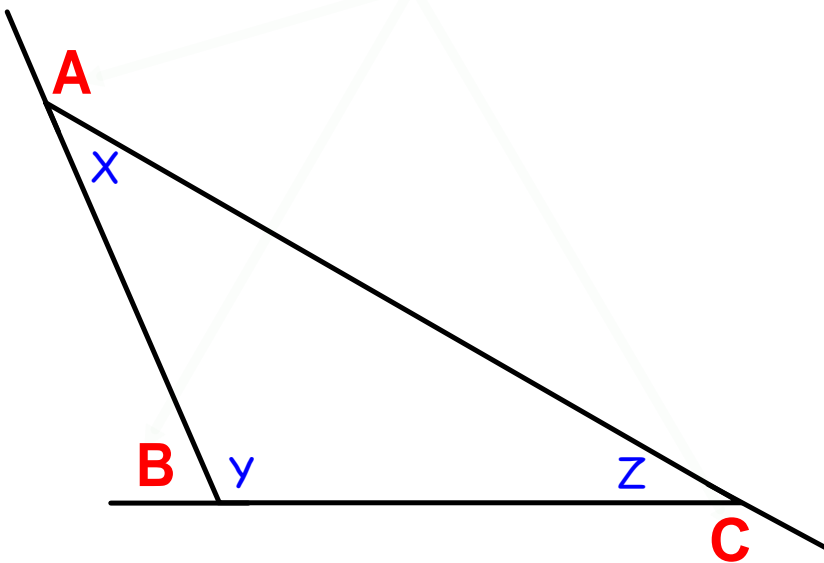
$$B + Y = 180^\circ$$

$$C + Z = 180^\circ$$

Action!

Theorems

What about the
exterior angles of a triangle?



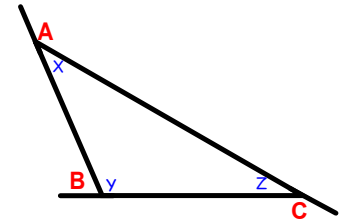
Action!

We know that

$$\begin{matrix} 180^\circ & 180^\circ & 180^\circ \\ (A + X) + (B + Y) + (C + Z) = 540^\circ \\ \text{SAT} & \text{SAT} & \text{SAT} \end{matrix}$$

AND

$$\begin{matrix} X + Y + Z = 180^\circ \\ \text{SATT} \end{matrix}$$



So...

$$A + X + B + Y + C + Z = 540^\circ$$

If we remove X, Y and Z we are taking away 180° worth of angles.

What do we have left?

We only have A, B and C left (the exterior angles!)

And we have to take 180° from 540° ...

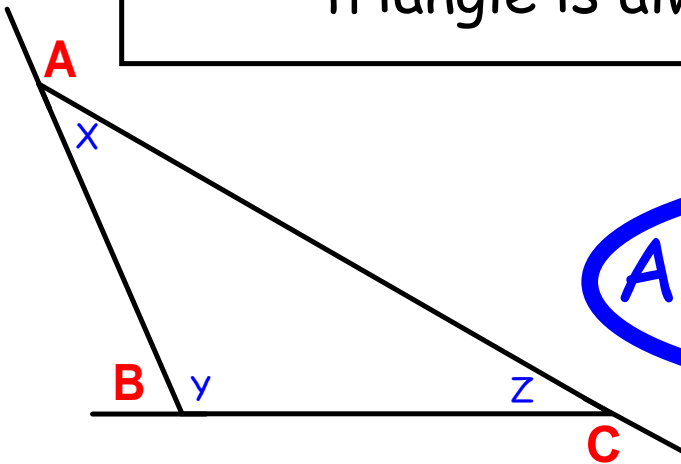
$$540^\circ - 180^\circ = 360^\circ$$

Action!

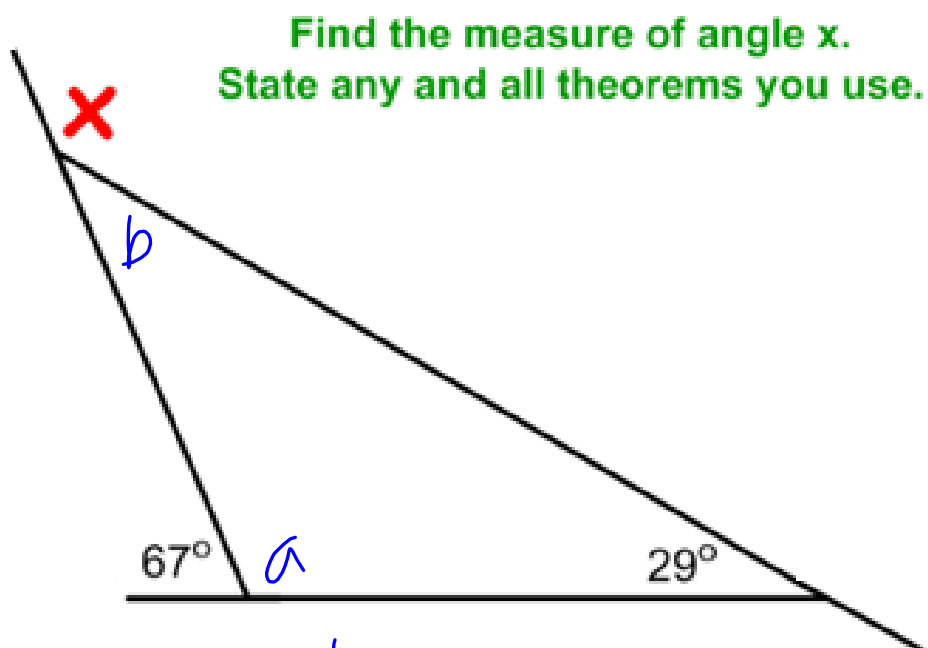
Theorems

The Exterior Angle Theorem (EAT)

The sum of the exterior angles of a triangle is always 360° .



$$A + B + C = 360^\circ$$



$$a = 113^\circ \text{ by SAT}$$
$$b = 38^\circ \text{ by IAT}$$
$$x = 142^\circ \text{ by SAT}$$

Consolidation

New Terms

Opposite Angles

Transversal

Alternate Angles

Corresponding Angles

Co-Interior Angles

Interior Angle

Exterior Angle

Supplementary Angles

Consolidation

New Theorems

Opposite Angle Theorem

Alternate Angle Theorem

Corresponding Angle Theorem

Co-Interior Angle Theorem

Interior Angle Theorem

Supplementary Angle Theorem

Exterior Angle Theorem

Consolidation

Exit Card

Consolidation

Exit Question

