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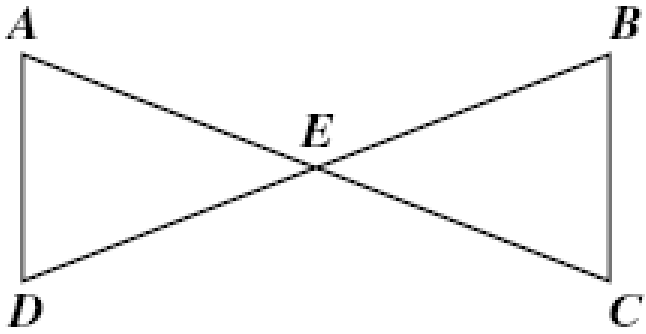
CHAPTER 5 SOL PROBLEMS

SSM: Super Second-grader Methods

SOL Problems; not Dynamic Variable Problems

15 **Given: In this figure, $\overline{AC}$ and $\overline{BD}$ bisect each other.**



Based on the information given, which triangle congruence theorem could be used to prove $\triangle AED \cong \triangle CEB$?

A Angle-Angle-Side (AAS)

B Angle-Side-Angle (ASA)

C Side-Angle-Side (SAS)

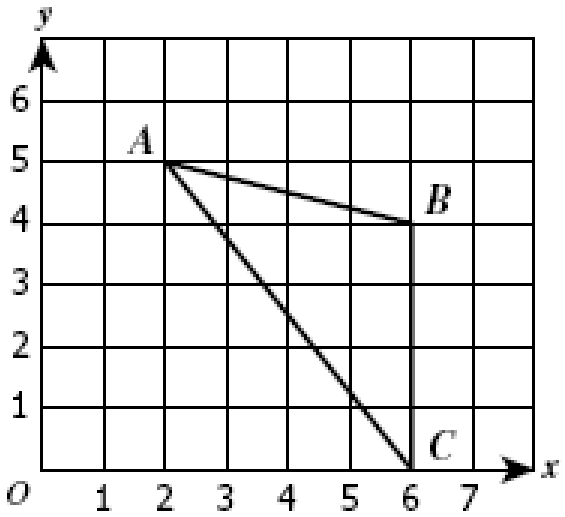
D Side-Side-Side (SSS)

SSM:

- **bisect cuts sides in half → two S's; eliminates A and B**
- **Need another side or an angle**

Bisects means AE and EC are congruent and BE and ED are congruent
vertical angles; ∠AED ≅ ∠CEB
this yields SAS (since angle is included)

17 Coordinates $A(2, 5)$, $B(6, 4)$, and $C(6, 0)$ are connected to form $\triangle ABC$.



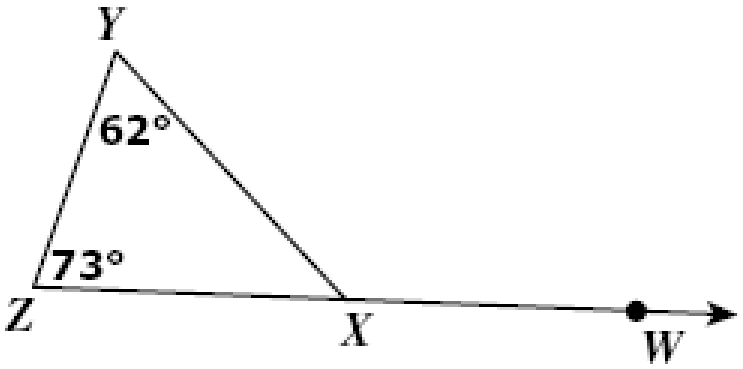
SSM:
- **plot all answers**
- **see which one makes sense (triangles look the same)**

If $\triangle CDA$ is congruent to $\triangle ABC$, what are the coordinates of D ?

A (1, 1)
B (1, 2)
C (2, 2)
D (2, 1)

AB and CD must match up (order rules!)
A to B is down 1 and over 4
From C to D must be over 4 and up 1

30 In the figure shown, what is $m\angle WXY$?



F 45°

G 107°

H 120°

J 135°

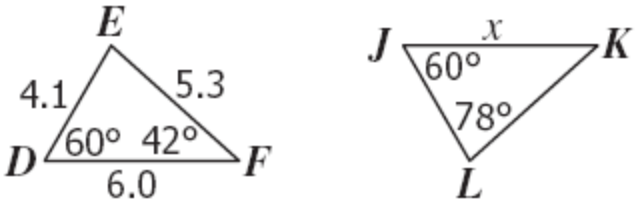
SSM:

- **$\angle WXY$ is obtuse; eliminates F**
- **180 is magic number**

$\angle WXY$ is an exterior angle and equal to sum of remote interior

$\angle WXY = 62 + 73 = 135$

12



What value of x makes $\triangle DEF \cong \triangle JLK$?

F $x = 9.4$
G $x = 6.0$
H $x = 5.3$
J $x = 4.1$

SSM:
- **Our eyes tell us that JK and DF are longest sides**
- **Congruent means equal so JK = DF**

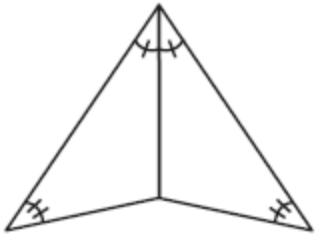
ASA provides triangle congruence
$\angle D \cong \angle J$ and $\angle K \cong \angle F$ (after solving for missing angles)
the included side between the two pairs of angles must be equal

22 With the information given in the drawings, which pair of triangles can be proven congruent by the Side-Angle-Side postulate?

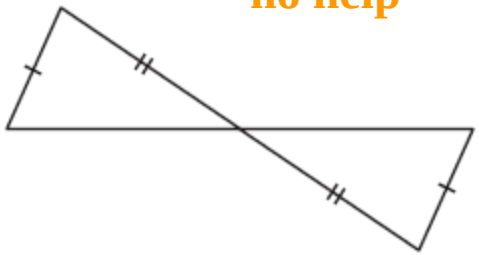
SSM:
- **no help**

F

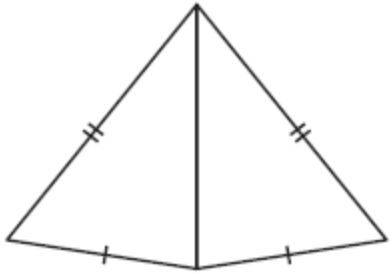
G



H



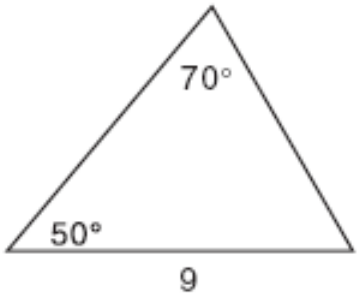
J



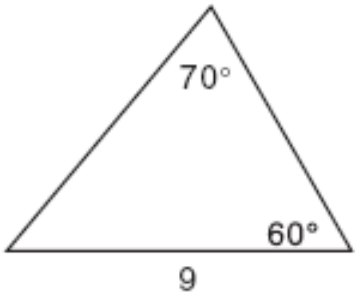
Replace the congruent angles with "A" and the congruent sides with "S"
F – SAS
G – AAS (included side)
H – SSA (vertical angle)
J – SSS (included side)

15 Which triangle below is *not* congruent to the other three triangles?

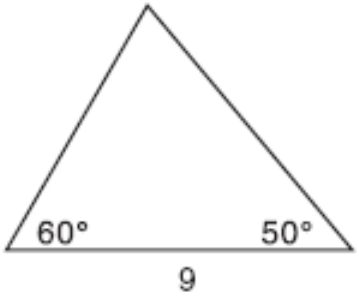
A



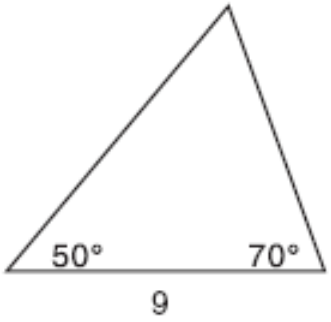
C



B



D

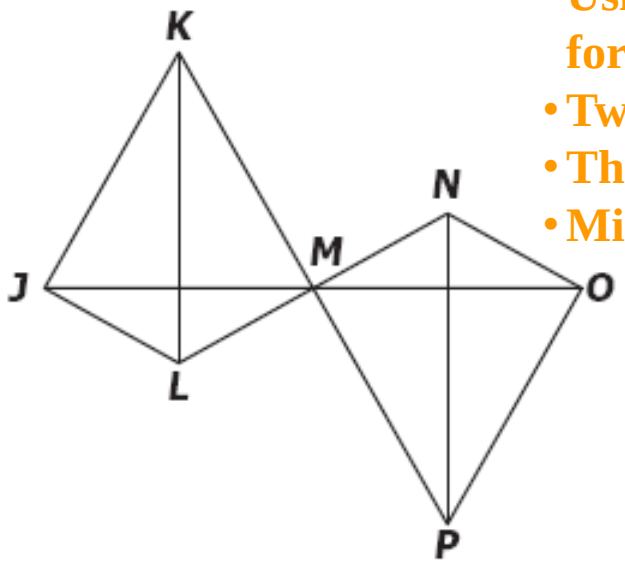


9 has to be opposite the 70° angle (from answer A and C)
Answer B we can figure the missing angle to be 70°
So answer D has 9 opposite a 60° angle

SSM:

- **Use eyes (or scratch paper) to see which triangle is different**

17 Given: M is the midpoint of $\overline{LN}$ and $\overline{KP}$.



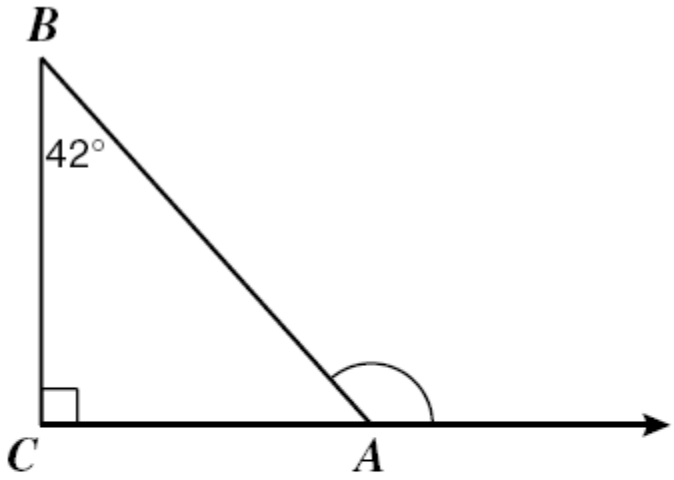
The given information is sufficient to prove $\triangle KML \cong \triangle PMN$ by which postulate/theorem?

A Angle-Side-Angle
B Side-Side-Side
C Side-Angle-Side
D Angle-Angle-Side

SSM:
- Using given info mark S and A for congruent sides or angles
- Two sides → SAS or SSS
- Third S → shared side (NO!)
- Middle A → vertical angle (YES!)

Midpoints divide segments into congruent halves:
so LM = MN and KM = MP
Vertical angles ∠KML ≅ ∠NMP
so SAS

1



Which of the following is the measure of the supplement of $\angle CAB$?

A 42°

B 90°

C 132°

D 142°

SSM:

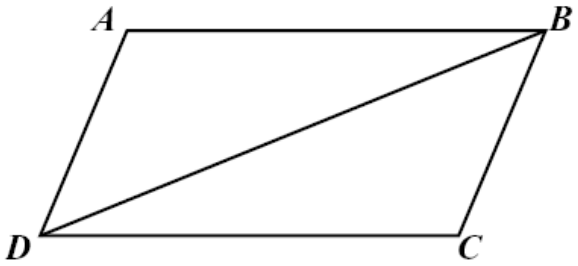
- **supplement of $\angle$ CAB is obtuse**
- **eliminates A and B**

$\angle$CAB = 48 (3 angles of triangle sum to 180)

supplement (adds to 180)

180 – 48 = 132

17 Given: $ABCD$ is a parallelogram.



Prove: $\Delta ABD \cong \Delta CDB$

$\angle A \cong \angle C$	Opposite angles of a parallelogram are congruent.
$\overline{AD} \cong \overline{BC}$	Opposite sides of a parallelogram are congruent.
$\overline{AB} \cong \overline{CD}$	Opposite sides of a parallelogram are congruent.

Therefore, $\Delta ABD \cong \Delta CDB$ by which postulate/theorem?

A SSA
B ASA
C SAS
D AAS

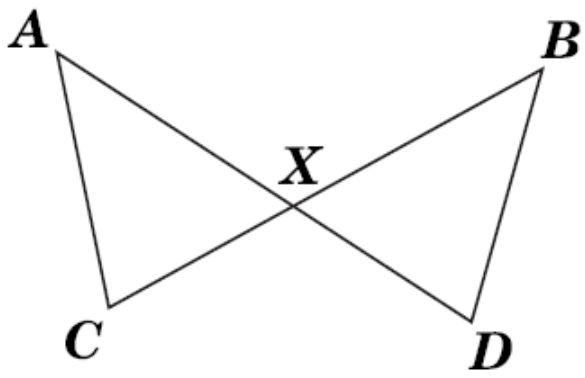
SSM:

- label sides, S, and angles, A
- two sides and one angle
- answer A is not correct

label one triangle with S for congruent sides and A for congruent angles

SAS

17 Given: $\overline{AD}$ and $\overline{BC}$ intersect at X
$AX = XB$
$CX = XD$



SSM:
- flip triangle over a line going through X
- ∠C matches to ∠D

Which congruency statement is true?

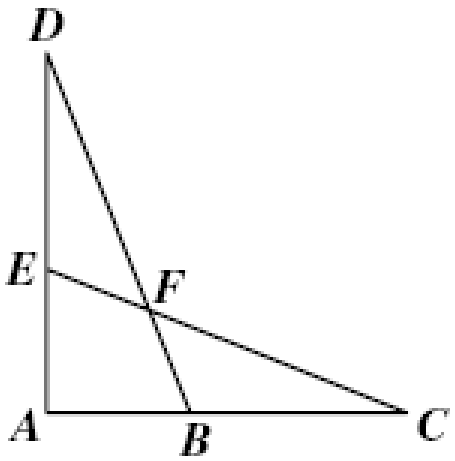
A $\angle ACX \cong \angle BXD$
B $\angle ACX \cong \angle DXB$
C $\angle ACX \cong \angle BDX$
D $\angle ACX \cong \angle DBX$

Line up sides of the right triangle to the sides of the left triangle

AX to XB; CX to XD; and AC to BD

Angle C lines up with Angle D

15 Given: $\overline{AD} \cong \overline{AC}$ and $\overline{AB} \cong \overline{AE}$



SSM:
- **Given two sides so C and D can't be right**
- **Shared side or angle ??**

Which could be used to prove $\Delta ADB \cong \Delta ACE$?

A (SSS) If 3 sides of one triangle are congruent to 3 sides of another triangle, then the triangles are congruent.

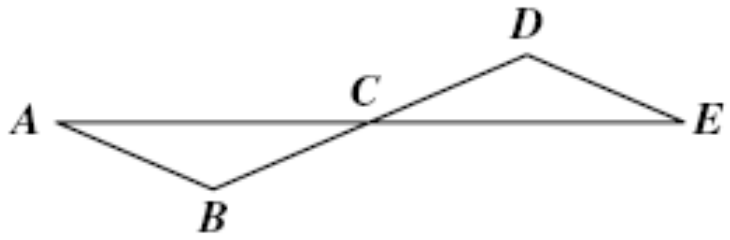
B (SAS) If 2 sides and the angle between them in one triangle are congruent to 2 sides and the angle between them of another triangle, then the triangles are congruent.

C (ASA) If 2 angles and the sides between them are congruent to 2 angles and the side between them of another triangle, then the triangles are congruent.

D (AAS) If 2 angles and a side not between them are congruent to 2 angles and the side not between them of another triangle, then the triangles are congruent.

Angle A is a shared angle, so SAS and B fits

15 Given: $\overline{AE}$ and $\overline{BD}$ bisect each other at C.



SSM:
- **bisect → cut into equal halves**

Which could be used to prove $\Delta ABC \cong \Delta EDC$?

A (SSS) If 3 sides of one triangle are congruent to 3 sides of another triangle, then the triangles are congruent.

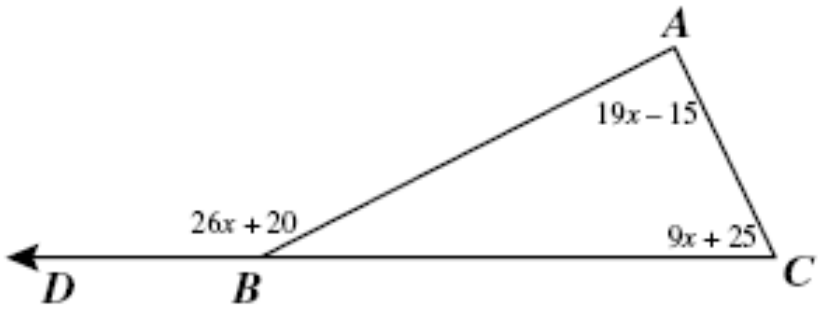
B (SAS) If 2 sides and the angle between them in one triangle are congruent to 2 sides and the angle between them in another triangle, then the triangles are congruent.

C (ASA) If 2 angles and the side between them of one triangle are congruent to 2 angles and the side between them of another triangle, then the triangles are congruent.

D (AAS) If 2 angles and a side not between them are congruent to 2 angles and a side not between them of another triangle, then the triangles are congruent.

From the bisections we get two sides then we need to find an angle or another side. We get an angle from C being vertical angles!

29 The figure has angle measures as shown.



What is the measure of $\angle ABD$?

A 150°
B 80°
C 70°
D 30°

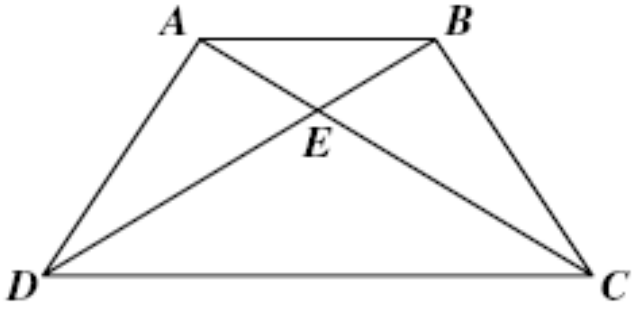
SSM:
- **$\angle ABD$ is obtuse**
- **only answer A fits**

angle ABD is an exterior angle

$\angle ABD = \angle BAC + \angle BCA$
$26x + 20 = 19x - 15 + 9x + 25$
$26x + 20 = 28x + 10$
$26x + 10 = 28x$
$10 = 2x$
$5 = x$

$26(5) + 20 = 130 + 20 = 150 = \angle ABD$

15



Given: $\overline{AC} \cong \overline{BD}$
$\overline{AD} \cong \overline{BC}$

Which could be used to prove $\Delta DCA \cong \Delta CDB$?

A (SSS) If 3 sides of one triangle are congruent to 3 sides of another triangle, then the triangles are congruent.

B (SAS) If 2 sides and the angle between them in one triangle are congruent to 2 sides and the angle between them in another triangle, then the triangles are congruent.

C (ASA) If 2 angles and the side between them of one triangle are congruent to 2 angles and the side between them of another triangle, then the triangles are congruent.

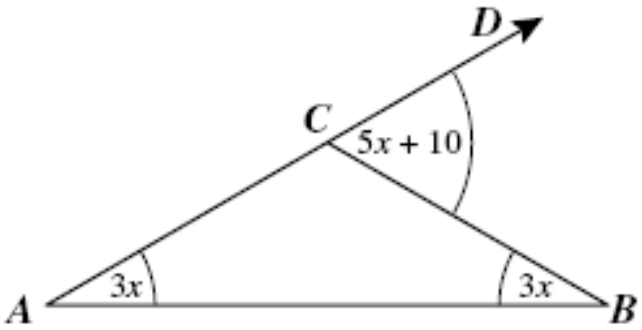
D (AAS) If 2 angles and a side not between them are congruent to 2 angles and a side not between them of another triangle, then the triangles are congruent.

SSM:

- **Given two sides and no angles eliminates C and D**
- **looking for shared side or angle, or looking for vertical angles**

Draw out triangles
Label given with "S"
DC is a shared side between the two triangles; this gives us SSS

27 The figure has angle measures as shown.



What is the measure of $\angle BCD$?

A 120°
B 80°
C 60°
D 30°

SSM:

- **$\angle$BCD is an medium acute angle eliminates A (and B and D)**

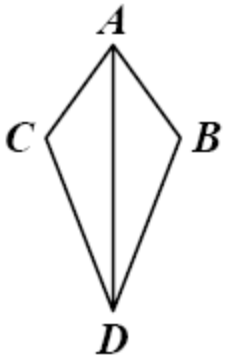
$\angle$BCD is an exterior angle and is equal to the sum of the remote interior angles

5x + 10 = 3x + 3x
5x + 10 = 6x
10 = x **so $\angle$BCD = 60**

SSM:

- **Using given info mark S and A for congruent sides or angles**
- **Two sides → SAS or SSS**
- **Third S → shared side (YES!)**

16 **Given:** $\overline{AC} \cong \overline{AB}$
$\overline{DC} \cong \overline{DB}$



Which could be used to prove $\Delta ABD \cong \Delta ACD$?

Given two sides congruent
shared side gives third side congruent
SSS

F (SSS) If 3 sides of one triangle are congruent to 3 sides of another triangle, then the triangles are congruent.

G (SAS) If 2 sides and the angle between them in one triangle are congruent to 2 sides and the angle between them in another triangle, then the triangles are congruent.

H (ASA) If 2 angles and the side between them of one triangle are congruent to 2 angles and the side between them of another triangle, then the triangles are congruent.

J (AAS) If 2 angles and a side not between them are congruent to 2 angles and a side not between them of another triangle, then the triangles are congruent.