4.2 - 4.5 Recap Name: Key

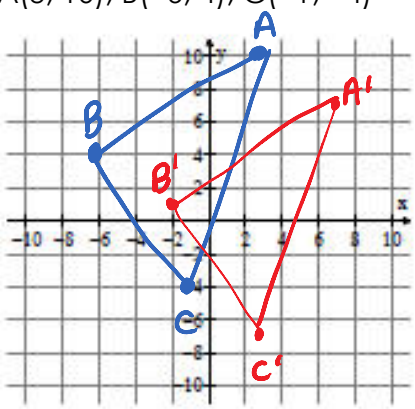
Directions: Complete each section and check your answers. Then, self-assess your understanding of each target using a 1 to 5 scale, where 1 is "Not Good", 3 is "Okay", and 5 is "I Got This!!!"

4.1 Congruence and Transformations

Learning Target 4.1.a: Draw, identify & describe transformations in the coordinate plane.

1. Apply the transformation M to the polygon with the given vertices. Name the coordinates of the image points. Identify and describe the transformation.

M (x, y) → (x + 4, y − 3)
A(3, 10), B(−6, 4), C(−1, −4)



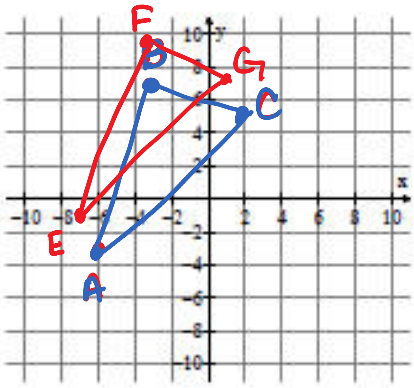
A' (7,7)
B' (-2,1)
C' (3,-7)

Translation
Right 4, Down 3

Learning Target 4.1.b: Determine whether figures are congruent. 1 2 3 4 5

2. Determine whether the polygons with the given vertices are congruent. Support your answer by describing a transformation.

A(−6, −3), B(−3, 7), C(2, 5)
E(−7, −1), F(−4, 9), G(1, 7)



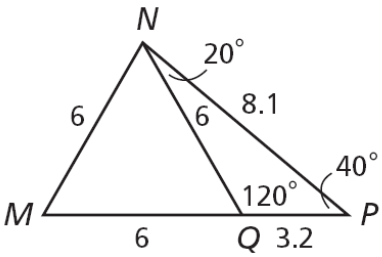
Yes: $\triangle ABC \cong \triangle EFG$, because $\triangle ABC$ was translated left 1 unit and up 2 units!

4.2 Classifying Triangles

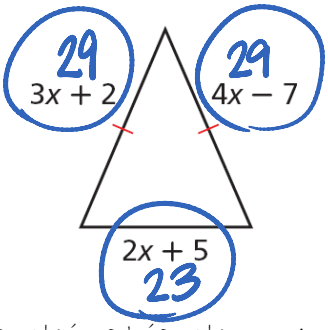
Learning Target 4.2: Classify a triangle by its sides and angles. 1 2 3 4 5

Classify each triangle by its angles ***and*** sides.

1. ΔMNQ Angles: equiangular Δ
   Sides: equilateral Δ
2. ΔNQP Angles: Obtuse Δ
   Sides: Scalene Δ



3. Find the side lengths of the triangle.



Isosceles Δ

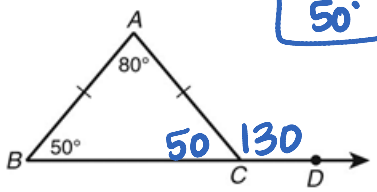
$3x+2=4x-7$

$\boxed{9=x}$

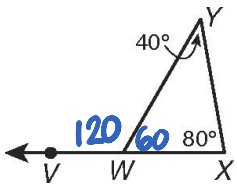
4.3 Angle Relationships in Triangles

Learning Target 4.3.a: Use the Triangle Sum Theorem to find a missing angle in a triangle. 1 2 3 4 5

4. Find the measure of $\angle ACB$ $\boxed{50°}$ and $\angle ACD$ $\boxed{130}$



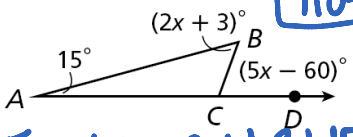
5. Find the measure of $\angle XWY$ $\boxed{60°}$ and $\angle VWY$ $\boxed{120°}$



Learning Target 4.3.b: Use the Exterior Angle Theorem to find a missing angle in a triangle. 1 2 3 4 5

6. Find the measure of $\angle BCA$ $\boxed{110°}$

Ext∠ = sum of remote int ∠s



1st $5x-60=2x+3+15$

$3x=78$

$x=26$

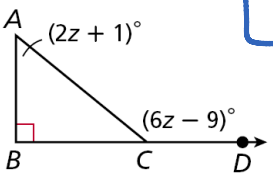
2nd $m\angle BCD=5(26)-60$

$=70°$

$m\angle BCD=180-70$

$=110°$

7. Find the measure of $\angle ACD$ $\boxed{141°}$



$6z-9=2z+1+90$

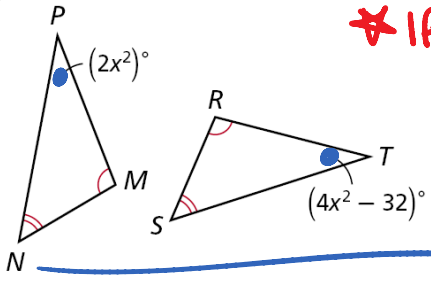
$4z=100$

$z=25$

$m\angle ACD=6(25)-9$

Learning Target 4.3.c: Apply the Third Angle Theorem to find angle measures. 1 2 3 4 5

8. Find the value of x.



$2x^2=4x^2-32$

$0=2x^2-32$

$0=2(x^2-16)$

$0=2(x+4)(x-4)$

* If 2 ∠s of one Δ are ≅ to 2 ∠s of another Δ, then the 3rd ∠s are ≅ *

→ so $\boxed{x=4}$ or $\boxed{x=-4}$

4.4 Congruent Triangles

Learning Target 4.4: Identify congruent corresponding parts of congruent polygons. 1 2 3 4 5

9. Given that polygon $MNOP \cong$ polygon $QRST$,

$\overline{PM} \cong$ TQ and $\angle N \cong$ ∠R.

10. **Given:** $\triangle ABC \cong \triangle JKL$

$AB = 2x + 12$

$JK = 4x - 50$

Find: the value of x.

$4x-50=2x+12$

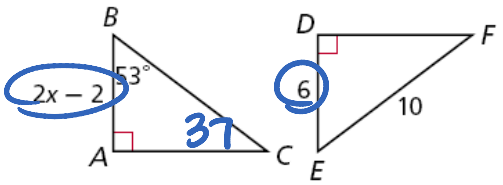
$2x=62$

$\boxed{x=31}$

11. **Given:** $\Delta ABC \cong \Delta DEF$

Find: x and AB and $m\angle F$

$\boxed{4}$ $\boxed{6}$ $\boxed{37°}$



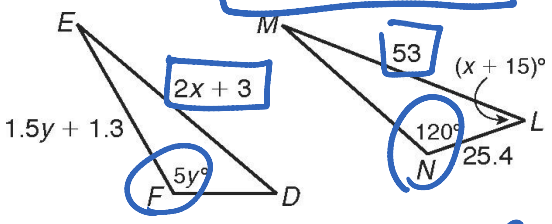
$2x-2=6$
$2x=8$
$x=4$

$AB=2(4)-2$
$AB=6$

12. **Given:** $\Delta DEF \cong \Delta LMN$

Find: $m\angle L$ and EF

$\boxed{40° \quad 37.3}$



$5y=120$
$y=24$

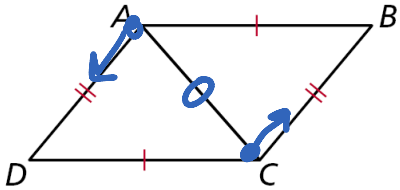
$2x+3=53$
$2x=50$
$x=25$

$m\angle L = 25+15=40$
$EF = 1.5(24)+1.3=37.3$

4.5 Triangle Congruence SSS and SAS

Learning Target 4.5: Prove triangles congruent by SSS and SAS. 1 2 3 4 5

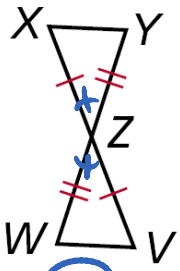
13. Determine whether or not the triangles below are congruent. If yes, write a triangle congruence statement and name the congruence postulate that proves them congruent.



Circle: Yes or No?

$\Delta ADC \cong \Delta CBA$

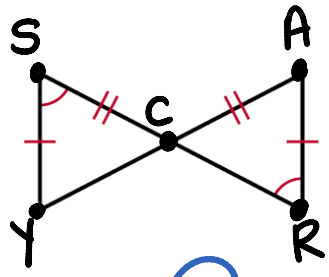
By SSS



Circle: Yes or No?

$\Delta XZY \cong \Delta VZW$

By SAS



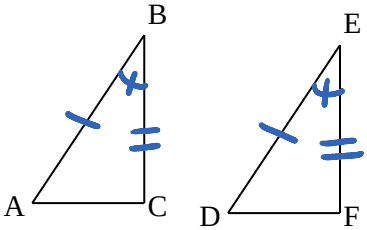
Circle: Yes or No?

$____ \cong ____$

By

14. Given: $\overline{AB} \cong \overline{DE}$
$\angle B \cong \angle E$
$\overline{BC} \cong \overline{EF}$

Prove: $\Delta ABC \cong \Delta DEF$

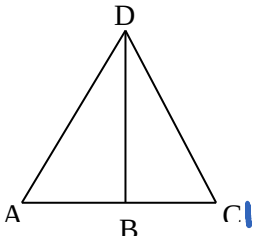


Statements	Reasons
1 $\overline{AB} \cong \overline{DE}$ S	1 Given
2 $\angle B \cong \angle E$ A	2
3 $\overline{BC} \cong \overline{EF}$ S	3
4 $\Delta ABC \cong \Delta DEF$	4 SAS (1,2,3)

15. Given : $\overline{AD} \cong \overline{CD}$

B is the midpoint of $\overline{AC}$

Prove: $\triangle ABD \cong \triangle CBD$

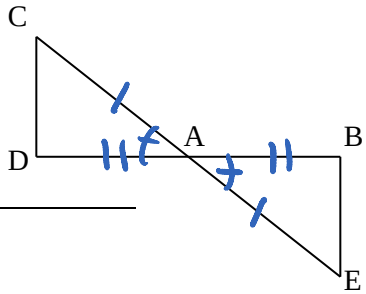


Statements	Reasons
1 $\overline{AD} \cong \overline{CD}$ S	1 given
2 B is midpt of $\overline{AC}$	2 ↓
3 $\overline{AB} \cong \overline{BC}$ S	3 If midpt, then ≅ segs
4 $\overline{DB} \cong \overline{DB}$ S	4 Reflexive Prop
5 $\triangle ABD \cong \triangle CBD$	5 SSS (1,3,4)

16. Given : $\overline{AC} \cong \overline{AE}$

A is the midpoint of $\overline{DB}$

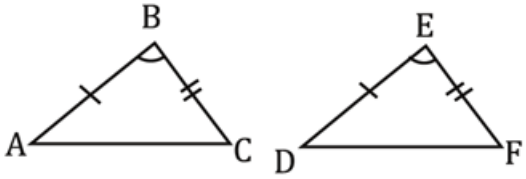
Prove : $\Delta ACD \cong \Delta AEB$



Statements	Reasons
1 $\overline{AC} \cong \overline{AE}$ S	1 given
2 A is midpt of $\overline{DB}$	2 ↓
3 $\overline{DA} \cong \overline{AB}$ S	3 If midpt., then ≅ segs
4 $\angle CAD$ and $\angle EAB$ are VA	4 Assumed
5 $\angle CAD \cong \angle EAB$ A	5 If VA, then ≅
6 $\triangle ACD \cong \triangle AEB$	6 SAS (3,5,1)

19. Given: $\overline{AB} \cong \overline{DE}$, $\overline{BC} \cong \overline{EF}$, $\angle B \cong \angle E$

Prove: $\triangle ABC \cong \triangle DEF$



Statements	Reasons
1. $\overline{AB} \cong \overline{DE}$ (S)	1. Given
2. $\overline{BC} \cong \overline{EF}$ (S)	2. G ↓
3. $\angle B \cong \angle E$ (A)	3. G
4. $\triangle ABC \cong \triangle DEF$	4. SAS (1,3,2)