8

Mathematics 8

Quarter 3- Week 5
Module 3: Solving Corresponding Parts of Congruent Triangles

AIRs - LM

Mathematics 8
Quarter 3- Week 5 Module 5: Solving corresponding parts of congruent triangles First Edition, 2021

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Target

Good day mathematicians!

This module is designed and written to help you solve corresponding parts of congruent triangles. **CPCTC** is an acronym for **corresponding parts of congruent triangles are congruent**. **CPCTC** is commonly used at or near the end of a proof which asks the learners to show that two angles or two sides are congruent. It means that once two triangles are proven to be congruent, then the three pairs of sides that correspond must be congruent and the three pairs of angles that correspond must be congruent.

In the lessons, you are given the opportunity to use your prior knowledge and skills on CPCTC. Activities are also given to process your knowledge and skills acquired, deepen and transfer your understanding. The scope of this module enables you to use it to many different learning situations.

Before we start, let us consider first the learning competencies:

1. solves corresponding parts of congruent triangles. (**M8GE-IIIf-1)**

After going through this module, you are expected to:

1. determine the corresponding parts of congruent triangles.
2. solve corresponding parts of congruent triangles.

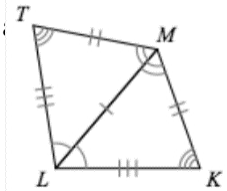
Before going on, check how much you know about this topic. Answer the pre-test on the next page in a separate sheet of paper.

Pre- Assessment: Choose the letter of the correct answer. Write your answer on a separate sheet of paper.

_____1. If ΔLMK ≅ ΔLMT, then ∠K ≅ ____

A. T B. ∠T C. ∠M D. ∠L

_____2. Which statement indicates that the triangles in each pair congruent?



A. ΔLMK ≅ ΔLMT B. ΔLMK ≅ ΔTMK

C. ΔLTKM ≅ ΔLMT D. ΔTMK ≅ ΔTLK

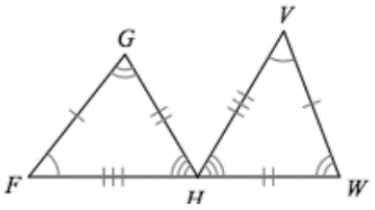
_____3. Remember order matters. Which of the following is true?

A. ΔFGH ≅ ΔVHW

B. ΔHFG ≅ ΔHWV

C. ΔHGF ≅ ΔVHW

D. ΔFGH ≅ ΔVWH



_____4. In congruent triangles, corresponding parts are always _____.

A. acute B. equal C. equilateral D. opposite

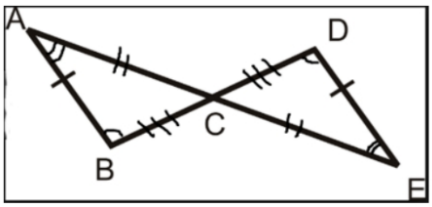
_____5. From the given figure, ∠E ≅ ∠ __?

A. A

B. B

C. C

D. D



_____6. Which of the following is the symbol used for congruent?

A. ≅ B. ≠ C. ∠ D. Δ

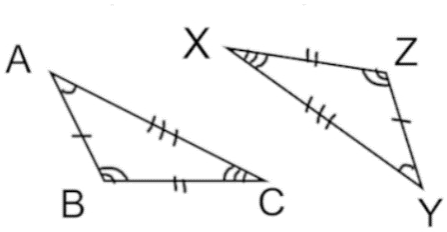
_____7. From the given figure, ΔXYZ ≅ Δ ___

A. CAB

B. BAC

C. ABC

D. ACD



_____8. If ΔCDE ≅ Δ CDI, then $\overline{DE}$ ≅ ____?

A. $\overline{IC}$ B. $\overline{CD}$ C. $\overline{DI}$ D. ∠C

_____9. If ΔDEF ≅ ΔRST, then we can conclude that ∠S ≅ ____.

A. ∠F B. ∠E C. ∠D D. $\overline{DE}$

_____10. If ΔDEF ≅ ΔRST, then we can conclude that ∠R ≅ ____.

A. ∠F B. ∠E C. ∠D D. $\overline{DE}$

_____11. Congruent sides have the same number of _____

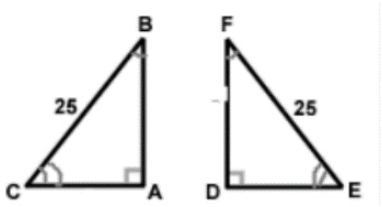
A. arcs B. dots C. point D. slash marks

_____12. Figures of the same shape and size are _____.

A. congruent B. corresponding C. similar D. unique

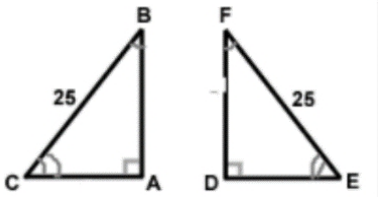
_____13. These two triangles are congruent. If ∠C is 40° find the measure of ∠F.

A. 40°
B. 50°
C. 90°
D. 45°



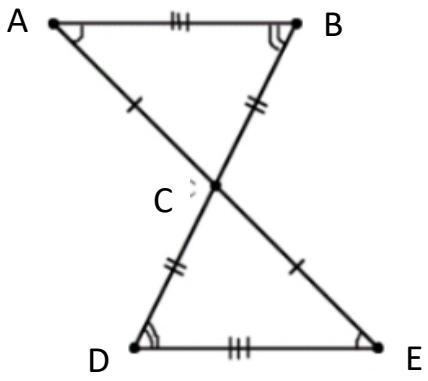
____14. These triangles are congruent. If ∠A is 48° what is the measure of ∠F?

A. 38°
B. 48°
C. 84°
D. 94°



____15. These triangles are congruent. If ∠E is 45° and ∠B is 55° what is the measure of ∠C?

A. 45°
B. 55°
C. 80°
D. 100°



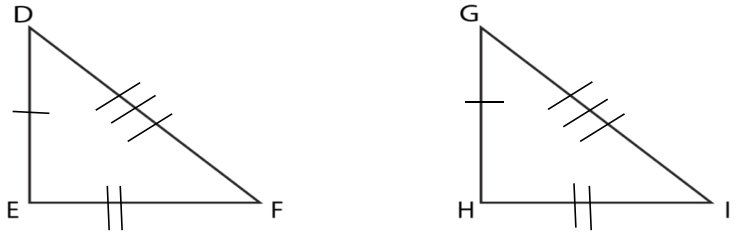
Lesson 1 Solving the Corresponding Parts of Congruent Triangles

The word **corresponding** refers to parts that match between two congruent triangles. You can identify corresponding angles and corresponding sides. The angles are connected with the symbol for congruent. When you see the equals sign with a squiggly line on top, you know that the items on each side of the equation are congruent. Corresponding sides are matching sides between two triangles. They will have the same length in congruent triangles. Let's get started!

Jumpstart

Activity 1: Do We Look Alike?

Directions. Use the following triangles to answer the questions.



Questions:

1. Are these two triangles **similar** or congruent?
2. How do you know?
3. Side DE is congruent to which other side?
4. Side DF is congruent to which other side?
5. Side EF is congruent to which other side?
6. Angle D is congruent to which another angle?
7. Angle E is congruent to which another angle?
8. Angle F is congruent to which another angle?
9. If the side length of DE is 10, what is the side length of GH?
10. If the side length of HI is 8, which other side is also 8?

How did you find the activity? Were you able to recall congruency? Were you able to determine if the corresponding sides/angles of the triangles are congruent? Fantastic! Keep Going!

Discover

Congruency is a term used to describe two objects with the same shape and size*. The symbol for congruency is* ≅ **.** *In triangles, we use the abbreviation* ***CPCTC*** *to show that the* ***Corresponding Parts of Congruent Triangles*** *are* ***Congruent.*** *Congruency is neither calculated nor measured but is simply determine by visual inspection. Triangles can become congruent in three different motions, namely, rotation, reflection and translation.*

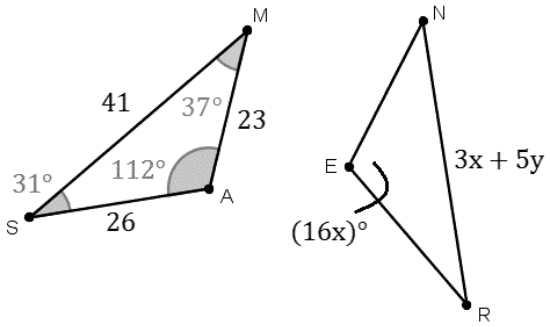
Activity 2: Step NO? Step YES?

Directions. Read and understand the given situation and answer it with **YES** or **NO**.

1. You must be well aware about the photocopy machine. _____
2. When you put an **A4 page** inside the machine and activate it, you get an identical copy of that page. _____
3. If you rotate or flip the page, it will remain the same as the original page. _____
4. Even if you cut them out, you can line them up again easily. _____
5. Thus, we can say the pages are **similar or congruent .** _____
6. Further, the A4 page is in a rectangular shape, so when you cut it diagonally, you will get the triangle. _____
7. If you cut both the photocopies in the same manner, you will see both of them will form the same kind of a triangle. _____
8. Will they have the same set of angles? _____
9. Will they have the same set of sides? _____
10. Does CPCTC means that once two triangles are proven to be congruent, then the three pairs of sides that correspond must be congruent and the three pairs of angles that correspond must be congruent? _____

Activity 3: What's my Value?

Directions: Find the values of *x* and *y* given that $\Delta MAS \cong \Delta NER$.



A. Solve for x:

$\angle A \cong \angle E$

$m\angle A = m\angle E$

112 = 16x

x* = *(1)

B. Solve for y:

$41 = 3(7) + 5y$

$41 = 21 + 5y$

$20 = 5y$

y* = *(2)

C. Substitute values of x and y:

$\overline{SM} \cong \overline{RN}$

$41 = 3x + 5y$

41 = ***(3)*** + ***(4)***

41 = ***(5)***

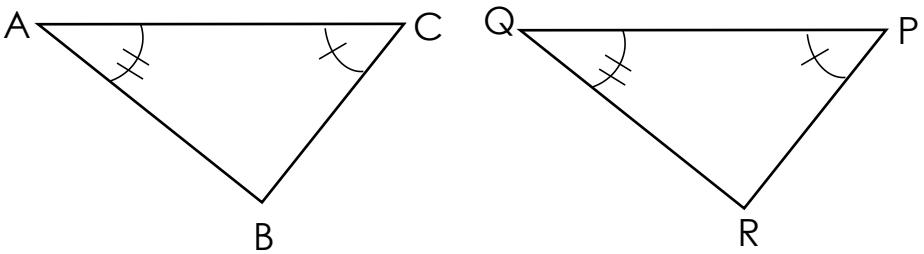
Explore

For you to understand the lesson well, do the following activities. Have fun and good luck!

Activity 4: Problem Solved!

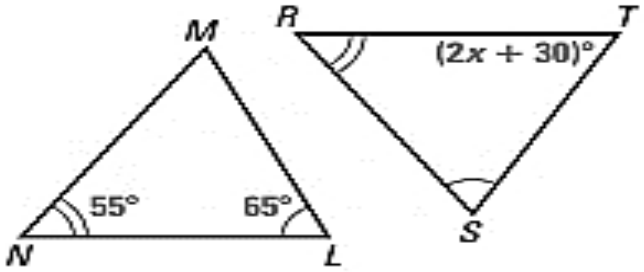
Directions. Solve the following.

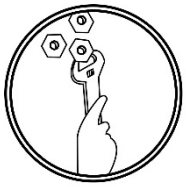
1. Given that $\angle ABC$ = (2x + 30) °, $\angle PQR$ = 55 ° *and* $\angle$ *RPQ* = 65 °, solve for the value of x.



2. Describe the type of congruence in two triangles given by; Δ ABC, AB = 7 cm, BC = 5 cm, ∠B = 50° and Δ DEF, DE = 5 cm, EF = 7 cm, ∠E = (3x-13)°. Solve for the value of x.

3. Solve for the value of x.





Deepen

Here are some enrichment activities for you to explore on to master and strengthen your skills in solves corresponding parts of congruent triangles.

Activity 5:

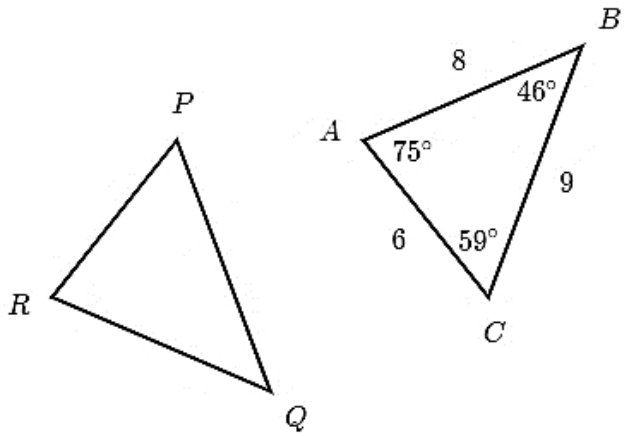
1-3. Find the value of x so that triangles ABC and XYZ are congruent.
$\overline{AB}$ = 16x +14; $\overline{BC}$ = 12; $\overline{AC}$ = 3x + 13; $\overline{XZ}$ = 16; $\overline{YZ}$ = 3x + 9; $\overline{YZ}$ = 30

x= _____ *x*= _____ *x*= _____

Given: *ΔABC is congruent to ΔRQP.*

4. What is the length of I

5. What is the measure of m∠PQR?



Congratulations for reaching this far! You are now ready to take the assessment test. Good luck!

Gauge

Post Assessment: Read each item carefully. Identify the choice that best completes the statement or answers the question

____1. What does CPCTC stand for?

A. Congruent parts of congruent triangles are congruent.
B. Corresponding parts of congruent triangles are congruent.
C. Corresponding parts of corresponding triangles are corresponding.
D. Corresponding parts of congruent triangles are Canadian.

____2. When do you use "CPCTC in a proof?

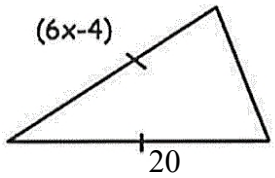
A. Always at the beginning
B. Always at the end
C. It's optional
D. Never

____3. Which is NOT a test to prove triangles congruent?

A. SAA B. SSS C. SSA D. SAS

____4. Find for the value of x.

A. x = 5
B. x = 4
C. x = -4
D. x = 20



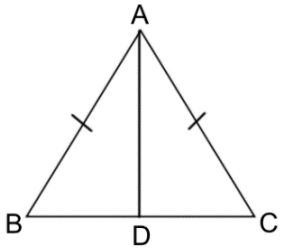
____5. What can we conclude in the figure if ΔBAD ≅ ΔCAD by SAS?

A. ∠ADB and ∠ADC are right angles

B. ∠B≅∠C

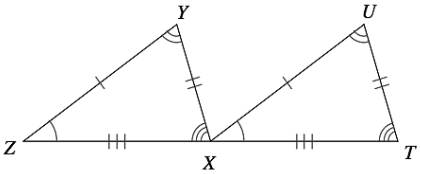
C. ∠BAD≅∠CAD

D. None of the above



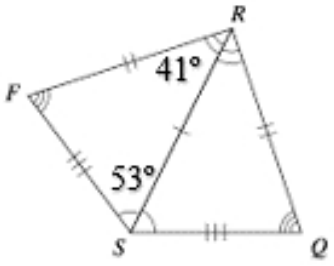
____6. Which of the following statements is not true?

A. ∠Z = ∠X
B. ∠Y = ∠U
C. ∠YXZ = ∠T
D. ∠YXZ = ∠UXT



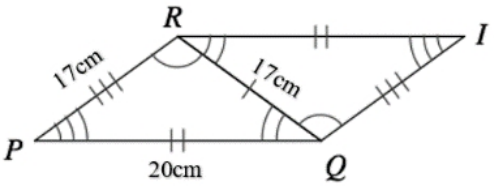
____7 If ΔSRQ ≅ ΔSRF, what is the measure of <RQS?

A. 6°
B. 86°
C. 96°
D. 106°



____8. If ΔRQP ≅ ΔQRI , what is the measure of $\overline{RI}$?

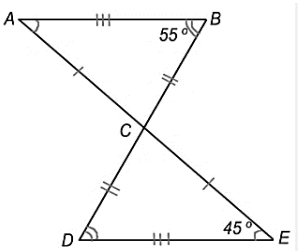
A. 17
B. 20
C. 37
D. 54



____9. If ΔPIG ≅ ΔCOW, which corresponding side is congruent to side WO?

A. GI B. PI C. PG D. IG

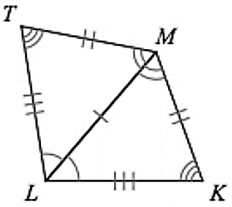
____10. These triangles are congruent. What is the measure of ∠ACB?



A. 45°
B. 55°
C. 80°
D. 100°

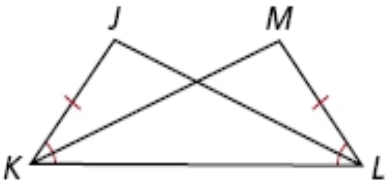
____11. Which statement indicates that the triangles in each pair are congruent.

A. ΔLMK ≅ ΔLMT
B. ΔLMK ≅ ΔTMK
C. ΔLKM ≅ ΔLMT
D. ΔTMK ≅ ΔTLK



____12. In the figure, ΔJKL ≅ ΔMLK by SAS. Which statement shows ∠J ≅ ∠M?

A. All right angles are congruent
B. Reflexive Property
C. Triangle JKL is congruent to Triangle MLK
D. Corresponding Parts of Congruent Triangles are Congruent

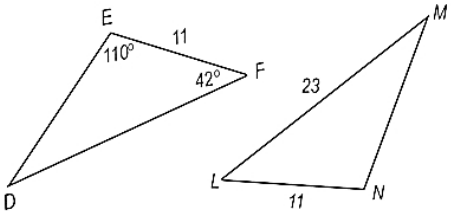


____13. If ΔLMK ≅ ΔLMT, then ∠K ≅ ____

A. T B. ∠T C. ∠M D. ∠L

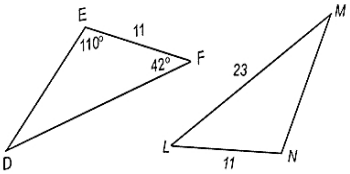
____14. If ΔDEF ≅ ΔMNL, which other angle is equal to 42o?

A. ∠ L
B. ∠ N
C. ∠ M
D. ∠ D



____15. If ΔDEF ≅ ΔMNL, then what is the measure of side DF?

A. 11
B. 23
C. 42
D. 1



Great job! You are awesome! You are almost done with this module.

Additional Activities:

A. Fill-Up my Problem!
Directions. Fill in the blanks to solve the given problem.

1. Δ ABC and Δ PQR are such that; $\overline{AB}$ = 3.5 cm, $\overline{BC}$ = 7.1 cm, $\overline{AC}$ = 2x + 1 cm,
   $\overline{PQ}$ = 7.1 cm, $\overline{QR}$ = 5 cm and $\overline{PR}$ = 3.5 cm. Solve for x to check whether the triangles are congruent.

Solution:

Given: AB = ___(1)____ = 3.5 cm
BC = PQ = _____(2)_____
____(3)_____ = QR = 5 cm

(4) x =_____

Therefore, ΔABC ≅ Δ___(5)____ ***(SSS)***

B. Journal Writing
Direction: *Reflect on the activities you have done in this lesson by completing the following sentences. Write your answers on your journal notebook.*

I learned that I

_____

I was surprised that I

_____

I noticed that I

_____

I discovered that I

_____

I was pleased that I

_____

References

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