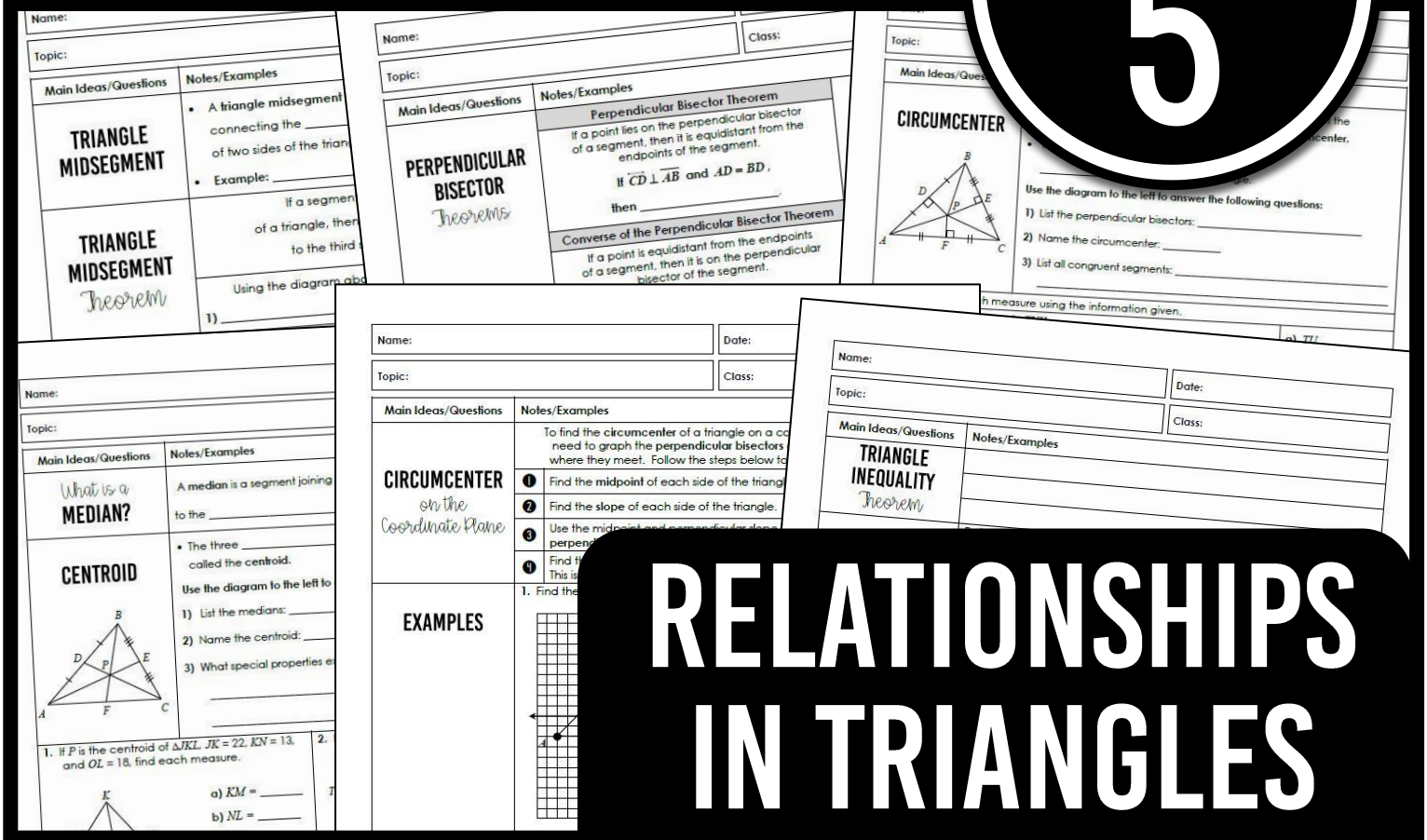
GEOMETRY

Unit 5



RELATIONSHIPS IN TRIANGLES

NOTES • HOMEWORK • QUIZZES • TEST

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Unit 5 – Relationships in Triangles: Sample Unit Outline

	TOPIC	HOMEWORK
DAY 1	Triangle Midsegments	HW #1
DAY 2	Perpendicular Bisectors & Angle Bisectors	HW #2
DAY 3	Circumcenter & Incenter (Includes Review of Pythagorean Theorem)	HW #3
DAY 4	**Quiz 5-1**	None
DAY 5	Medians & Centroid; Altitudes & Orthocenter	HW #4
DAY 6	Centers of Triangles Review	HW #5
DAY 7	**Quiz 5-2**	None
DAY 8	*Constructing Centers of Triangles (All Centers)	HW #6
DAY 9	*Centers of Triangles on the Coordinate Plane (Circumcenter, Centroid, and Orthocenter)	HW #7
DAY 10	***Quiz 5-3** (Constructions & the Coordinate Plane)	None
DAY 11	Triangle Inequalities	HW #8
DAY 12	Triangle Inequalities & Algebra	HW #9
DAY 13	Unit 5 Review	Study for Test
DAY 14	**UNIT 5 TEST**	None

***Note:** Constructing Centers of Triangles and Centers of Triangles on the Coordinate Plane were added as part of an update to this unit in April 2020. Aside from a bonus question on the test related to the centers on the coordinate plane, these topics are not present on the study guide or unit test.

SPECIAL SEGMENTS & CENTERS of triangles

TERM	DEFINTION	PICTURE
MIDSEGMENT	A se	
PERPENDICULAR BISECTOR	A line, segment, into two	
ANGLE BISECTOR	A line, segm angle into	
MEDIAN	A segment tha of a triangle t	
ALTITU		
CIRCUMC		
INCENT		
CENTR		

Name: Date:

Topic: Class:

Main Ideas/Questions	Notes/Examples
TRIANGLE MIDSEGMENT	• A **triangle midsegment** is a segment connecting the _____ of two sides of the triangles. • **Example:** _____
TRIANGLE MIDSEGMENT	If a segment joins the midpoints of tw of a tria to

Name: Date:

Topic: Class:

Main Ideas/Questions	Notes/Examples
What is a MEDIAN?	A **median** is a segment joining a _____ to the _____ of the opposite
CENTROID	• The three _____ of a triar called the **centroid.** **Use the diagram to the left to answer the follow**

1)

Name: Date:

Topic: Class:

Main Ideas/Questions	Notes/Examples
PERPENDICULAR BISECTOR Theorems	**Perpendicular Bisector Theorem** If a point lies on the perpendicular bisector of a segment, then it is equidistant from the endpoints of the segment. If $\overline{CD} \perp \overline{AB}$ and $AD = BD$, then _____. **Converse of the Perpendicular Bisector Theorem** If a point is equidistant from the endpoints of a segment, then it is on the perpendicular bisector of the segment.

Name: Date:

Topic: Class:

Main Ideas/Questions	Notes/Examples
CIRCUMCENTER	• The _____ _____ of the sides of a triangle intersect at a point called the **circumcenter.**

Centers of Triangles

Circumcenter	Incenter	Centroid	Orthoce
Created by:	Created by:	Created by:	Created

Name: Date:

Topic: Class:

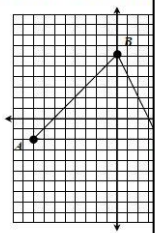
Main Ideas/Questions	Notes/Examples
What is an ALTITUDE?	An **altitude** is a segment joining a _____ to the opposite side so that it is _____ to that side.
ORTHOCENTER	• The three _____ of a triangle intersect at a point called the **orthocenter.** **Use the diagram to the left to answer the following questions:** 1) List the altitudes: _____ 2) Name the orthocenter: _____
CENT TRI	**Fill in the blanks.**

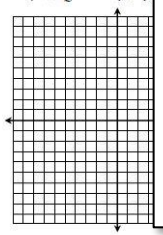
Altitudes can be inside, outside, or a side of the triangle

Name: Date:

Topic: Class:

Main Ideas/Questions	Notes/Examples
CIRCUMCENTER on the Coordinate Plane	To find the **circumcente** need to graph the per where they meet. Follo ❶ Find the **midpoint** of ea ❷ Find the slope of each ❸ Use the midpoint and p **perpendicular bisector** ❹ Find the **intersection** of This is the circumcenter
EXAMPLES	1. Find the coordinates of th 2. Graph ΔPQR with $P(-5, 2)$,





Name: Date:

Topic: Class:

Main Ideas/Questions	Notes/Examples
TRIANGLE INEQUALITY Theorem	
Can it form A TRIANGLE?	**Determine if the following side lengths could form answer with an inequality.** 1. 8, 17, 24 — 2. 3, 3, 7 3. 25, 35, 12 — 4. 52, 37, 4 5. 28, 50, 22 — 6. 6, 18, 14 7. 24, 12, 11 — 8. 41, 7, 35
FINDING A RANGE for the third side	**Given two sides of a triangle, you can set up an ine and difference to show the range of possible length** (Let x = the third side) 9. 14 and 22 — 10. 31 and 11. 3 and 11 — 12. 19 and 13. 24 and 7 — 14. 8 and **Given two of the side lengths, check all possible** 15. 15 ft and 27 ft ❑ 34 ft ❑ 12 ft ❑ 29 ft ❑ 18 ft ❑ 43 ft 16. 45 cm ❑ 35 ❑ 58 ❑ 47 ❑ 54 ❑ 39

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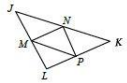
Unit 5 Test Study Guide
(Relationships in Triangles)

Name: _____

Date: _____ Per: _____

Topic 1: Midsegments

In the diagram below, $\overline{MN}$, $\overline{NP}$, and $\overline{PM}$ are midsegments.



1. Name all parallel segments:

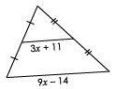
_____, _____, _____

2. If $MP = 17$, $LK = 24$ and $PN = 13$, find each measure.

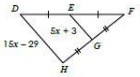
a) JK = _____ c) JL = _____

b) MN = _____ d) Perimeter of ΔJKL: _____

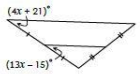
3. Solve for x.



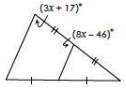
4. Find DH.



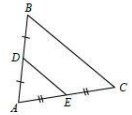
5. Solve for x.



6. Solve for x.



7. If $m\angle DEC = (12x - 3)°$, $m\angle BCE = (7x - 26)°$, and $m\angle DAE = 72°$, find each angle measure.



$m\angle DEC$ = _____

$m\angle BCE$ = _____

$m\angle ADE$ = _____

$m\angle EDB$ = _____

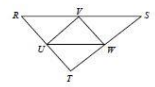
$m\angle DBC$ = _____

Name: _____

Date: _____ Per: _____

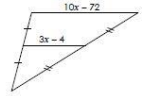
Unit 5 Test
Relationships in Triangles

1. Given $\overline{UV}$, $\overline{VW}$ and $\overline{UW}$ are midsegments, if $TS = 42$, $UW = 23$, and $VW = 19$, what is the perimeter of ΔRST ?



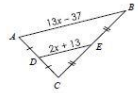
P =

2. Solve for x.



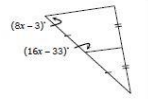
x =

3. Find DE.



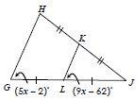
DE =

4. Solve for x.



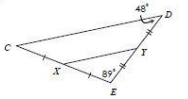
x =

5. Find $m\angle KLJ$.



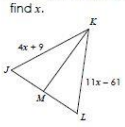
$m\angle KLJ$ =

6. Find $m\angle CXY$.



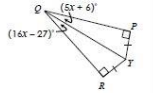
$m\angle CXY$ =

7. If $\overline{KM}$ is the perpendicular bisector of $\overline{JL}$, find x.



x =

8. Find $m\angle YQR$.



$m\angle YQR$ =