Formal Geometry Assignments 2022

Ch 5: Relationships in Triangles and Sem 1 Review

Check out the class website for worksheets and notes:

www.washoeschools.net/DRHSmath

Day	Date	Assignment (Due the next class meeting)
Friday Monday	11/18/22 (A) 11/21/22 (B))	Chapter 5 Extra Topics Wk
Tuesday	11/22/22 (A)	5.1 – 5.2 wk
Wed-Fri		THANKSGIVING
Monday	11/28/22 (B)	5.1 – 5.2 wk
Tuesday Wednesday	11/29/22 (A) 11/30/22 (B)	**(Extra Topics Quiz in class today.)** 5.3 pp.378-380 #15, 18, 23, 32 – 35, 41 **5.3 Extra Problems #1 – 3** 5.5 pp.397-398 #6, 14, 20, 21, 26 – 30 even, 43
Thursday Friday	12/01/22 (A) 12/02/22 (B)	5.4 pp.389-392 #13, 15, 47 **5.4 Extra Problems #1 – 5** 5.6 pp.406-407 #11 – 14, 17 – 20 **5.6 Extra Problems #1 – 5**
Monday Tuesday	12/05/22 (A) 12/06/22 (B)	Chapter 5 Review Worksheet and STUDY! **(Indirect Proof Quiz in class today.)**
Wednesday Thursday	12/07/22 (A) 12/08/22 (B)	STUDY DAY
Friday Monday	12/09/22 (A) 12/12/22 (B)	**Ch 5 Test in class** HW: **Semester Review Wk #1**. Due next class. Use the provided solutions to correct your missed problems before the next class. Work MUST be shown on every problem.
Tuesday Wednesday	12/13/22 (A) 12/14/22 (B)	Ch 5 Test Corrections in class **Practice Final.** Work MUST be shown on every problem. Do all corrections with provided solutions.
Thursday Friday	12/15/22 (A) 12/16/22 (B)	**Semester Review Wk #2**. Work MUST be shown on every problem.
Monday	12/19/22 (C)	**Review for Final**
Tuesday Wednesday Thursday	12/20/22 12/21/22 12/22/22	**1st period and 2nd period Finals** **3rd period and 4th period Finals** **5th period and 6th period Finals**

- **Each problem will be worth 1 point unless specified.**
- **EVERY problem must be attempted in order to receive on-time credit.**
  - Every problem must be attempted with the picture drawn and work shown.
  - For proofs, you MUST write out the Given, Prove, and Diagram, and attempt at least two steps.
- **Corrections are expected to be done to earn back points missed for each assignment.**
- **Extra Problems start on the next page in this packet. Do work on your own paper.**

5.3 Extra Problems

1. A segment has endpoints $T(-2, 1)$ and $U(6, -3)$. Find the equation of the perpendicular bisector of $\overline{TU}$, in slope-intercept form.

2. What is the equation of the line, in slope-intercept form, going through (-1, 6), perpendicular to the line containing (-7, 4) and (-8, 7)?

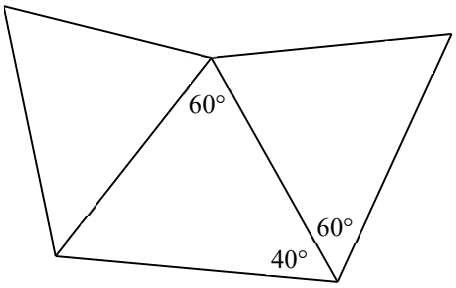
3. Based on the dimensions given in the diagram, what is the longest line segment in the diagram?

(A) $\overline{QS}$

(B) $\overline{RS}$

(C) $\overline{TQ}$

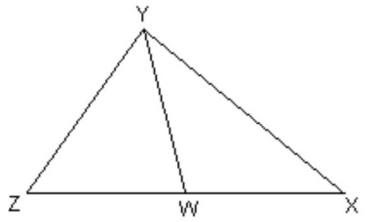
(D) $\overline{TS}$



5.4 Extra Problems: Complete each indirect proof (#1 – 5… continued on next page.)

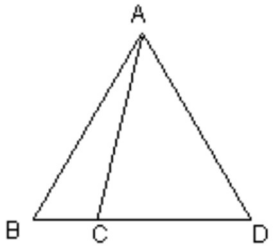
1. **Given**: $\overline{XY} \ncong \overline{YZ}$, $\overline{YW}$ bisects $\angle XYZ$

   Prove: $\angle X \ncong \angle Z$



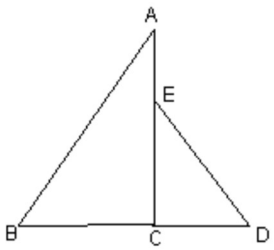
2. *Given*: $\overline{AB} \cong \overline{AD}, \angle BAC \ncong \angle DAC$

   Prove: $\overline{BC} \ncong \overline{DC}$



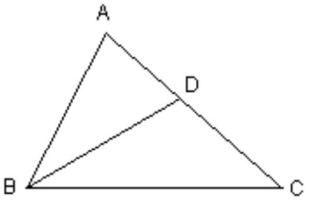
3. *Given*: $\overline{AC} \perp \overline{BD}, \overline{BC} \cong \overline{EC}, \overline{AB} \ncong \overline{ED}$

   Prove: $\angle B \ncong \angle CED$



4. *Given*: $\overrightarrow{BD}$ *bisects* $\angle ABC, \angle ADB$ *is acute.*

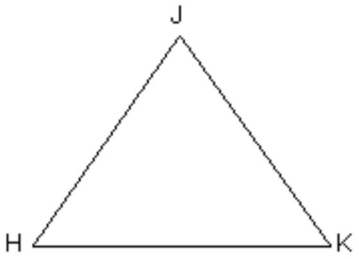
   Prove: $\overline{AB} \ncong \overline{BC}$



MORE on the next page!

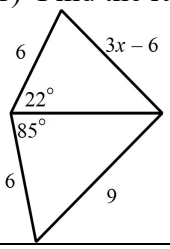
5. *Given*: $\angle H \cong \angle K$.

Prove: $\overline{JH} \cong \overline{JK}$

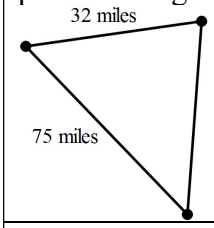


5.6 Extra Problems

1) Find the range of values containing x.

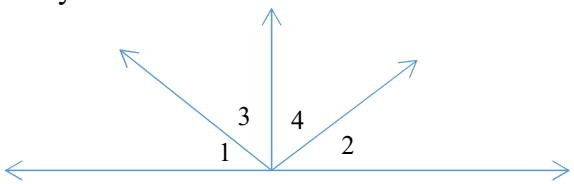


2) The captain of a boat is planning to travel to three islands in a triangular pattern. What is the possible range for the number of miles round trip the boat will travel?



3) Given the diagram where $\angle 4$ is complementary to $\angle 3$ and $\angle 1 \cong \angle 4$. Which of the following statements is **not** true?

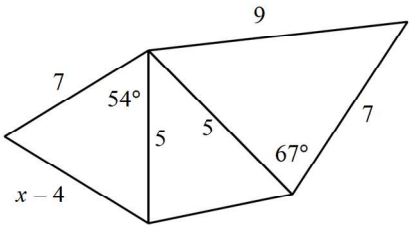
A) $\angle 1$ complementary $\angle 2$
B) $\angle 3 \cong \angle 2$
C) $\angle 1$ complementary $\angle 3$
D) $\angle 3 \cong \angle 4$



4) If a triangle has two sides with lengths of 8 cm and 14 cm. Which length below could **not** represent the length of the third side?

A) 7 cm B) 15 cm C) 13 cm D) 22 cm

5. Find the range of values for x.



Answers: Note: Work MUST be shown to receive any credit!

5.3: 1) $y = 2x - 5$ 2) $y = \frac{1}{3}x + \frac{19}{3}$ 3) B

5.6: 1) $2 < x < 5$ 2) between 150 and 214 miles 3) D 4) D
5) $6 < x < 13$

Ch 5 Extra Topics Worksheet: Do all work on your own paper!

1) Find the coordinates of the point P that lies along the directed line segment from A(3, 4) to B (6, 10), and partitions the segment in the ratio of 2:1.

2) Find the coordinates of the point P that lies along the directed line segment from A(3, 4) to B (6, 10), and partitions the segment in the ratio of 1:2.

3) Find the coordinates of the point P that lies along the directed line segment from A(-2, 1) to B (8, -5), and partitions the segment in the ratio of 3:2.

4) Find the coordinates of the point P that lies along the directed line segment from A(-2, 1) to B 8, -5), and partitions the segment in the ratio of 2:3.

5) Write the equation of the line (in slope-intercept form) that models the distance between the point (-3, 2) and the line $y = -4x$.

6) Write the equation of the line (in slope-intercept form) that models the distance between the point (-7, -1) and the line $y = x + 5$.

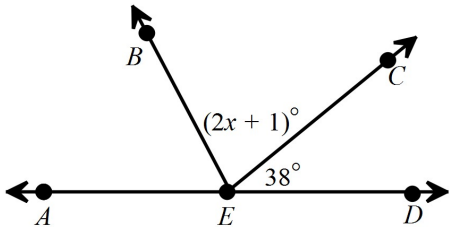
7) Write the equation of the line (in slope-intercept form) that models the distance between the point (5, -2) and the line $y = \frac{2}{3}x - 3$.

8) Find the coordinates of the point P that lies along the directed line segment from D (-7, -3) to E (4, 2), and partitions the segment in the ratio of 4:1.

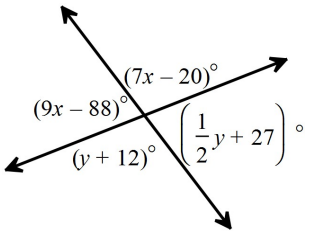
9) The point $P(-2, -5)$ is rotated 90° counterclockwise about the origin, and then the image is reflected across the line $x = 3$. What are the coordinates of the final image P''?

A) (1, -2) B) (11, -2) C) (-2, 1) D) (2, 11)

10) $\overrightarrow{EB}$ is the angle bisector of $\angle AEC$. What is the value of x?



11) Find the values of x and y in the diagram.



12) Francis is going on a 75-mile trip that can be represented on a gridded map by a directed line segment from point $M(-2, -5)$ to point $N(6, 20)$. What point represents 40 miles into the trip? Round your answers to the nearest hundredth.

13) The radius and height of a tree over an 18 year period can be presented by a directed line segment from point A (2, 5) to point B (8, 21). What point would represent 8 years into this time period? If needed, round to the nearest tenth.

BONUS: Line k is represented by the equation, $y = -4x + 3$. Find the distance between the line k and point $(5, 0)$. **Answer given in class!**

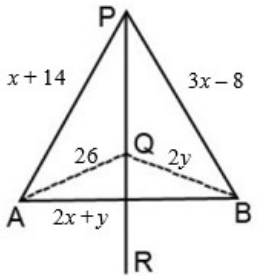
Answers: 1) (5, 8) 2) (4, 6) 3) $\left(4, -\frac{13}{5}\right)$ 4) $\left(2, -\frac{7}{5}\right)$ 5) $y = \frac{1}{4}x + \frac{11}{4}$

6) $y = -x - 8$ 7) $y = -\frac{3}{2}x + \frac{11}{2}$ 8) $\left(\frac{9}{5}, 1\right)$ 9) A 10) 35

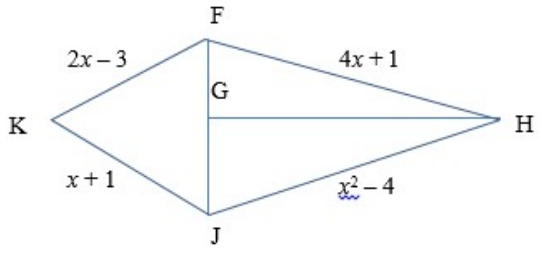
11) $x = 18, y = 94$ 12) (2.27, 8.33) 13) (4.7, 12.1)

5.1 – 5.2 Worksheet **Do all work on your own paper!**

1) Given the diagram where $\overline{PR}$ is the perpendicular bisector of $\overline{AB}$. Find the length of $\overline{AB}$.



2) Given the diagram, where $\overline{HG}$ is the perpendicular bisector of $\overline{FJ}$. Is K on $\overleftrightarrow{HG}$? Justify your conclusion.

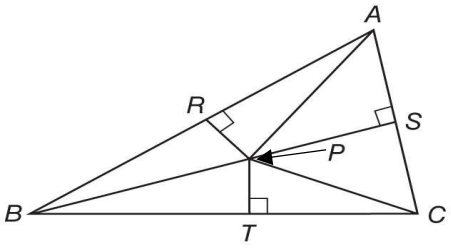


3) A segment has endpoints $A(3,-6)$ and $D(5,-1)$. Find the equation of the perpendicular bisector of $\overline{AD}$.

4) Which statement(s) below are true? Choose all that apply.
A) The circumcenter is formed by the intersection of all three angle bisectors of a triangle.
B) The circumcenter is formed by the intersection of all three perpendicular bisectors of a triangle.
C) The circumcenter is the center of the circle inscribed in the triangle.
D) The circumcenter is the center of the circle circumscribed about the triangle.

5) Given that DG is the perpendicular bisector of EF, and E = (-3, 1), F = (-1, -5). If DG and EF intersect at point Q, then find the coordinates of point Q.

For #6 – 8: Point *P* is the circumcenter of $\triangle ABC$. List any segment(s) congruent to each segment.



6) $\overline{BR}$ 7) $\overline{CS}$ 8) $\overline{BP}$

9) Given the coordinates of the vertices of ΔABC with median $\overline{CD}$, find the coordinates of D. A = (-2, 6); B = (3, -4); C = (1, -2)

For #10 – 11, given the coordinates of the vertices of ΔABC with altitude $\overline{CD}$, find the coordinates of D.

10) A = (-2, 5); B = (3, 5); C = (1, -2)

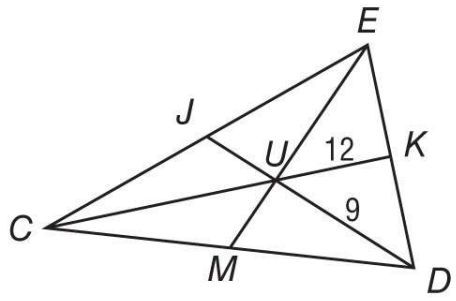
11) A = (3, -3); B = (-4, -3); C = (5, 4)

12) Given ΔABC with A(4, 4), B(4, -1), and C(-2, 1). Find the coordinates of D if BD is an altitude.

13) Given that ΔABC has A = (0, -3); B = (-4, 4); C = (6, 5) and BD is a median. Find the coordinates of D and the length of BD.

More on the next page!

For #14 – 19: In $\triangle CDE$, U is the centroid, $UK = 12$, $EM = 21$, and $UD = 9$. Find each measure.



14) CU

15) MU

16) CK

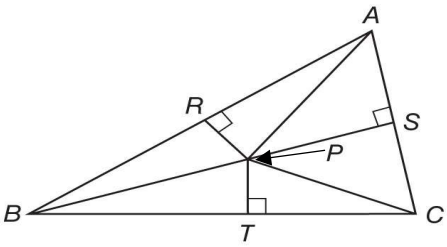
17) JU

18) EU

19) JD

20) Which of the following would provide the shortest distance from the vertex of a triangle to the opposite side? A) altitude B) diameter C) median D) segment

21) Given that P is the circumcenter of ΔABC, as shown to the right, which segments are congruent to $\overline{AP}$?



Answers:

1) 70

2) No, JK is not congruent to KF, so K is not equidistant to the endpoints of JF, so K is **not** on the perpendicular bisector HG.

3) $y = -\frac{2}{5}x - \frac{19}{10}$ 4) B, D 5) (-2, -2) 6) $\overline{AR}$ 7) $\overline{AS}$ 8) $\overline{AP}$ *and* $\overline{CP}$

9) (0.5, 1) 10) (1, 5) 11) (5, -3) 12) (2, 3) 13) D (3, 1); BD = $\sqrt{58}$ 14) $CU = 24$

15) $MU = 7$ 16) $CK = 36$ 17) $JU = \frac{9}{2}$ *or* 4.5 18) $EU = 14$

19) $JD = \frac{27}{2}$ *or* 13.5 *20) A* *21)* $\overline{BP}$, $\overline{CP}$

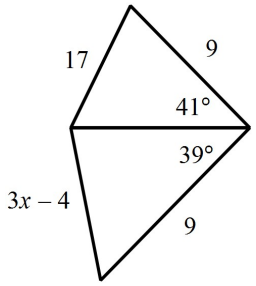
Formal Geometry **Name**_____
Ch 5 Review Worksheet

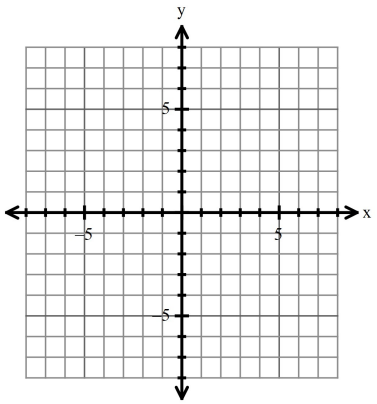
1. If a triangle has two sides with lengths of 6 cm and 19 cm. Which length(s) below could **not** represent the length of the third side? Choose all that apply.

A. 7 cm **C.** 25 cm

B. 13 cm **D.** 22 cm

2. Find the range of values for x.

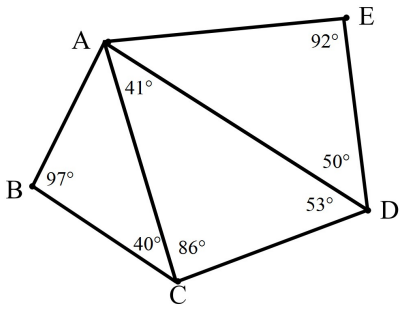




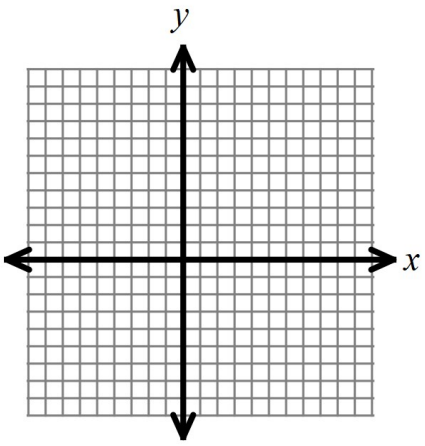
3. ΔPQR has P(2, 4), Q(-7, 1), and R(-2, -4).
Find A if AR is an altitude of ΔPQR.

4. Write the equation of the perpendicular bisector of CD if C(-4, 3) and D(-8, -9).

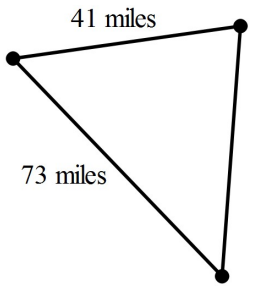
5. Identify the longest segment in the diagram shown. Explain your reasoning.



6. Given ΔWXY with W(3, -9), X(2, 11), and Y(-5, 1).
Find the coordinates of D if XD is a median.

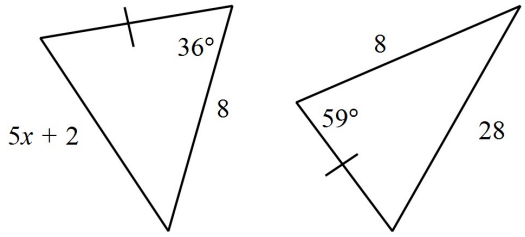


7. The captain of a boat is planning to travel to three islands in a triangular pattern. What is the possible range for the number of miles round trip the boat will travel?

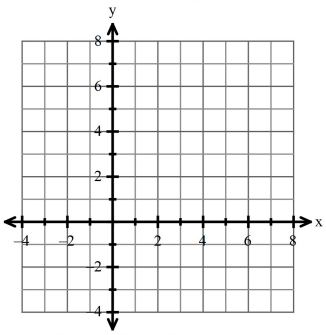


8. The radius and height of a tree over a 10-year period can be presented by a directed line segment from point A (2, 5) to point B (10, 15). What ordered pair would represent the radius and height 3 years into this time period? If needed, round to the nearest tenth.

9. Find the range of values for x in the diagram shown.

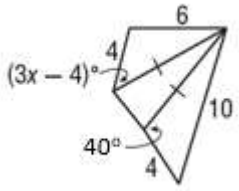


10. Given triangle ABC such that A(-3, 4), B(7, 1), and C(2, -1). Find D if AD is a median of the triangle.



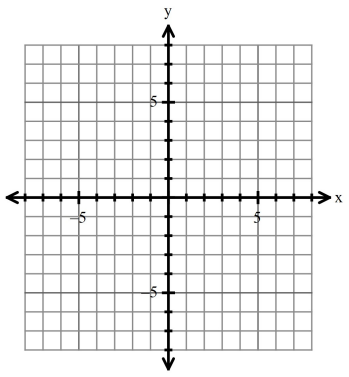
11. Given a directed segment BC with B(8, -3) and C(-2, 8). Point P is on BC. Find the coordinates of P if the ratio from BP to PC is 3:2.

12. Write and solve an inequality for x.



For #13 – 14, given triangle ABC such that A(4, -2), B(-4, 0), and C (2, 7).

13. Find D if CD is an altitude of the triangle.

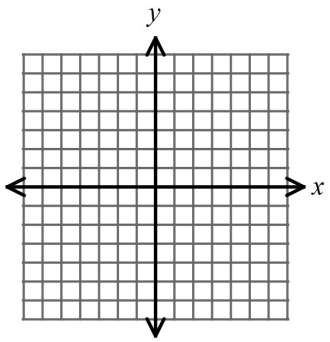


14. Find E if AE is a median of the triangle.

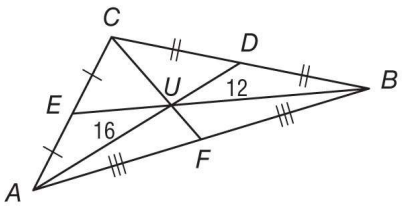
15. Write the equation of the line (in slope-intercept form) that models the distance between (-4, -3) and the line $y = -\frac{2}{7}x + 9$.

16. Find the range of possible values of x if each expression represents the measures of sides of a triangle:
$x + 2,\ \ x + 6,\ \ 3x - 4$

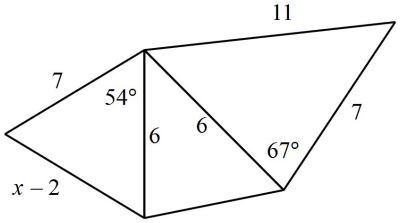
17. Triangle ABC has an altitude CD with A(-2, 5), B(3, 5), and C(6, -1). Find the coordinates of D.



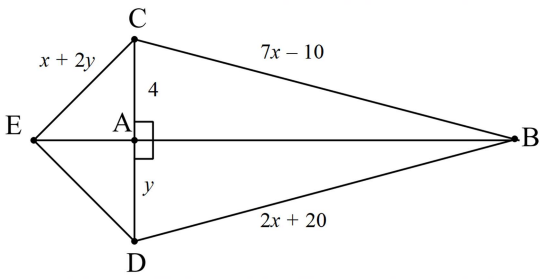
18) Given $\Delta ABC,$ If $CU = 3x - 2$ and $UF = x + 3$, Find x and CF.



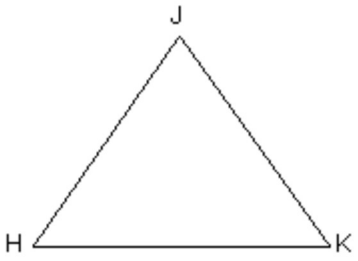
19) Write and solve an inequality for x.



20) Given that BE is the perpendicular bisector of CD, then find the length of ED.



21. **Given**: $\angle H \ncong \angle K$.
Prove: ΔJHK is not isosceles with base $\overline{HK}$.



Ch 5 Review Worksheet Key:

1. A, B, C
2. $\frac{4}{3} < x < 7$
3. $(-4, 2)$
4. $y = -\frac{1}{3}x - 5$
5. AD is the longest segment; it is the longest segment in both triangles ACD and ADE. AC is the longest segment in triangle ABC, but it is shorter than AD because it is across from a smaller angle in triangle ACD.
6. $(-1, -4)$
7. $146 <$ perimeter < 228
8. $(4.4, 8)$
9. $-\frac{2}{5} < x < \frac{26}{5}$
10. (4.5, 0)
11. $(2, 3.6)$
12. $\frac{4}{3} < x < \frac{44}{3}$
13. (0, -1)
14. (-1, 3.5)
15. $y = \frac{7}{2}x + 11$
16. $\frac{8}{3} < x < 12$
17) (6, 5)
18) $x = 8$, CF =33
19) $3 < x < 13$
20) 14

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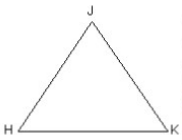
Given: $\angle H \ncong \angle K$.

Prove: ΔABC *is not isosceles with base HK.*



Either ΔJHK is isosceles with base HK or ΔJHK is not isosceles with base HK.
Assume ΔJHK is isosceles with base HK.
Given $\angle H \ncong \angle K$. $JH \cong JK$ by definition of an isosceles triangle (legs are congruent.) $\angle H \cong \angle K$ by the isosceles triangle theorem (if two sides of a triangle are congruent, then so are the angles opposite those sides.) But this is impossible because it contradicts the given that $\angle H \ncong \angle K$.

∴ Our assumption is false, and so ΔJHK is not isosceles with base HK is the only remaining possibility.