

Chapter 6 Group Review

VOCAB

~~1/4~~ $\frac{1}{2}$

1. A J is a segment that joins the midpoints of two sides of the triangle.
2. The E is the point of concurrency of the angle bisectors of the triangle.
3. The centroid is the point of concurrency of the G of the triangle.
4. A G is a segment that joins the vertex of one angle of a triangle and the midpoint of its opposite side.
5. The orthocenter is the point of concurrency of the H of the triangle.
6. The F is the point of concurrency of the altitudes of the triangle.
7. The ~~1/4~~ A is equidistant from the vertices of the triangle.
8. The E is equidistant from the sides of the triangle.
9. The B and E are ALWAYS inside the triangle
10. The A and F are outside the triangle when the triangle is L.

Word Bank

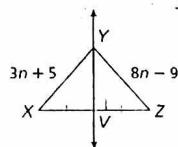
You may use some words twice! You may not use some at all!

- A. Circumcenter
- B. Centroid
- C. Perpendicular Bisector(s)
- D. Parallel
- E. Incenter
- F. Orthocenter
- G. Median(s)
- H. Altitude(s)
- I. Angle Bisector(s)
- J. Midsegment(s)
- K. Acute
- L. Obtuse
- M. Right

USING THEOREMS

$\frac{1}{8}$

11. Find YZ.



$$3n+5 = 8n-9$$

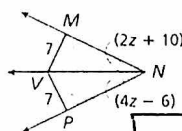
$$14 = 5n$$

$$n = 2.8$$

$$YZ = 13.4$$

$\frac{1}{8}$

12. Find $m\angle MNP$



$$2z+10 = 4z-6$$

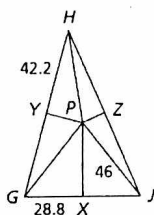
$$16 = 2z$$

$$8 = z$$

$$m\angle MNP = 52^\circ$$

$\frac{1}{4}$

13. $\overline{PX}$, $\overline{PY}$, and $\overline{PZ}$ are perpendicular bisectors of the triangle.



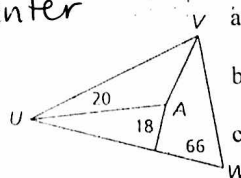
- a. This means P is the circumcenter

b. $GP = 46$

c. $PH = 46$

$\frac{1}{4}$

14. $\overline{UA}$ and $\overline{VA}$ are angle bisectors of the triangle.



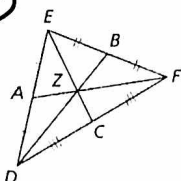
- a. This means A is the incenter

b. $m\angle WVU = 74^\circ$

c. $\angle WVA = 37^\circ$

$\frac{1}{4}$

15. In the triangle, $DB = 24.6$ and $EZ = 11.6$.



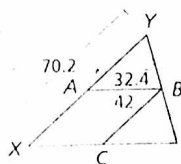
- a. This means Z is the centroid

b. $ZB = 8.2$

c. $EC = 17.4$

$\frac{1}{4}$

16. Given the triangle, answer the following.



- a. This means $\overline{BC}$ is a midseg.

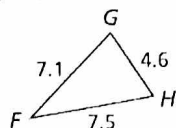
b. $BC = 35.1$

c. $XC = 32.4$

d. $m\angle BAX = 138^\circ$

$\frac{1}{8}$

17. Write the angles of the triangle from smallest to largest.



$\angle F, \angle H, \angle G$

$\frac{1}{8}$

18. Tell whether a triangle can have sides with the given lengths. Explain.

6.2, 8.1, 14.2

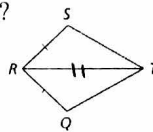
yes, $6.2 + 8.1 > 14.2$

19. Describe the possible lengths of the third side of the triangle given the lengths of the other two sides.
11 ft, 18 ft,

$$7 < x < 29$$

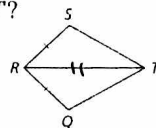
20. If $RQ = RS$ and $m\angle QRT > m\angle SRT$, then how does $\overline{QT}$ compare to $\overline{ST}$?

$$QT > ST$$



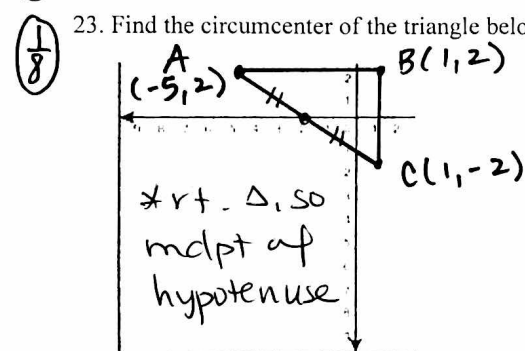
21. If $RQ = RS$ and $QT > ST$, then how does $\angle QRT$ compare to $\angle SRT$?

$$m\angle QRT > m\angle SRT$$

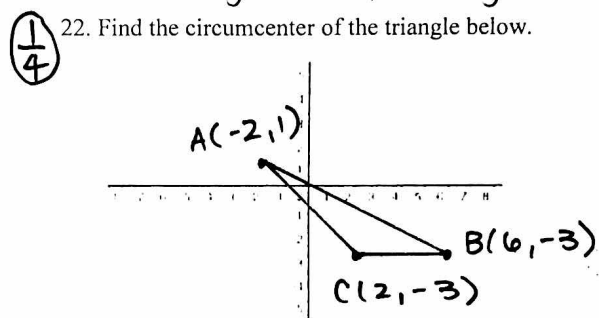


22. In an indirect proof you always assume the opposite of what you're proving.

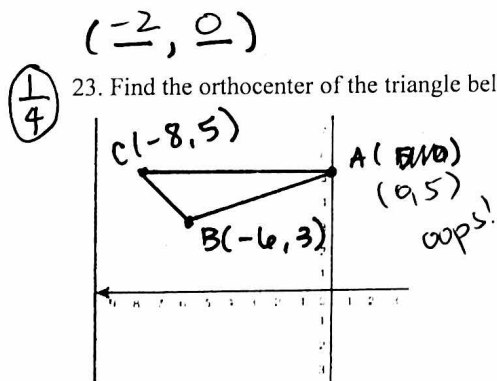
23. Find the circumcenter of the triangle below.



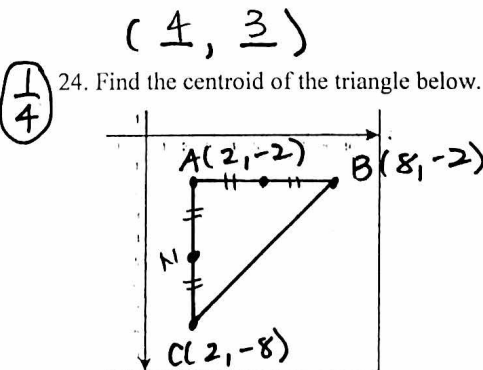
22. Find the circumcenter of the triangle below.



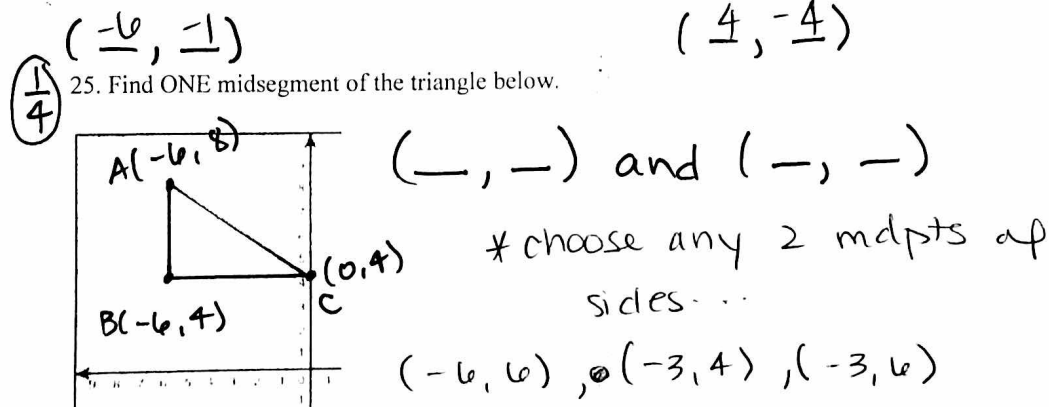
23. Find the orthocenter of the triangle below.



24. Find the centroid of the triangle below.



25. Find ONE midsegment of the triangle below.



#22

⊥ bisector of $\overline{CB}$:

* midpt $\overline{CB} = (4, -3)$

* vert. line! $x = 4$

⊥ bisector of $\overline{AC}$:

* midpt $\overline{AC} = (0, -1)$

* slope $\overline{AC} = \frac{-3-1}{2+2} = \frac{-4}{4} = -1$

⊥ slope = 1

* eqn. of line: $y - (-1) = 1(x - 0)$

$$y + 1 = x$$

$$y = x - 1$$

⊥ bisector of $\overline{AB}$:

* midpt $\overline{AB} = (2, -1)$

* slope $\overline{AB} = \frac{-3-1}{6+2} = \frac{-4}{8} = -\frac{1}{2}$

⊥ slope = 2

* eqn of line: $y - (-1) = 2(x - 2)$

$$y + 1 = 2x - 4$$

$$y = 2x - 5$$

Circumcenter: $y = 2(4) - 5$

$$y = 8 - 5$$

$$y = 3$$

$$\boxed{(4, 3)}$$

#23 altitude thru B:

* vertical line! $x = -6$

altitude thru C:

$$* \text{slope } \overline{AB} = \frac{5-3}{0+6} = \frac{2}{6} = \frac{1}{3}$$

$\perp$ slope $= -3$

$$\begin{aligned} * \text{eqn of line: } y-5 &= -3(x-(-8)) \\ y-5 &= -3(x+8) \\ y-5 &= -3x-24 \\ y &= -3x-19 \end{aligned}$$

altitude thru A:

$$* \text{slope } \overline{CB} = \frac{5-3}{-8+6} = \frac{2}{-2} = -1$$

$\perp$ slope $= 1$

$$\begin{aligned} * \text{eqn of line: } y-5 &= 1(x-0) \\ y-5 &= x \\ y &= x+5 \end{aligned}$$

$$\begin{aligned} \text{orthocenter: } y &= -6+5 \\ y &= -1 \end{aligned}$$

$$\boxed{(-6, -1)}$$

#23 altitude thru B:

* vertical line! $x = -6$

altitude thru C:

$$* \text{slope } \overline{AB} = \frac{5-3}{0+6} = \frac{2}{6} = \frac{1}{3}$$

$\perp$ slope $= -3$

$$* \text{eqn of line: } y-5 = -3(x - (-8))$$

$$y-5 = -3(x+8)$$

$$y-5 = -3x - 24$$

$$y = -3x - 19$$

altitude thru A:

$$* \text{slope } \overline{CB} = \frac{5-3}{-8+6} = \frac{2}{-2} = -1$$

$\perp$ slope $= 1$

$$* \text{eqn of line: } y-5 = 1(x-0)$$

$$y-5 = x$$

$$y = x+5$$

orthocenter: $y = -6+5$

$$y = -1$$

$$\boxed{(-6, -1)}$$