

GEOMETRY

Exam 5

Based on Chapter 5 (pages 292 - 349) in your textbook.

Student's Name _____ Student Number _____

Street _____ City _____ State _____ Zip
Code _____

BE SURE YOU FULLY UNDERSTAND ALL CHECKPOINT PROBLEMS FROM THIS CHAPTER BEFORE YOU COMPLETE THIS EXAM. **SHOW AS MUCH WORK AS POSSIBLE.**

1. Vocabulary: Match each of the following terms with the proper description beneath by writing the correct letter on the blank.

- | | |
|---------------------------------------|---|
| _____ Midsegment of a triangle | (A) The point of concurrency of the altitudes of a triangle |
| _____ Perpendicular bisector | (B) A perpendicular segment from the vertex to the opposite side or line containing the opposite side |
| _____ Circumcenter of a triangle | (C) The point of concurrency of the medians of a triangle |
| _____ Distance from a point to a line | (D) Connects the midpoints of two sides of triangle |
| _____ Angle bisector | (E) Intersects a segment at right angles at its midpoint |
| _____ Incenter of a triangle | (F) The point equidistant from the three vertices of a triangle |
| _____ Median of a triangle | (G) A segment from a vertex to the midpoint of the opposite side of a triangle |
| _____ Centroid of a triangle | (H) The point equidistant from the three sides of a triangle |
| _____ Altitude of a triangle | (I) Divides an angle into two congruent adjacent angles |
| _____ Orthocenter of a triangle | (J) The length of the perpendicular segment from a point to a line |

2. Circle the correct answer for the following:

The point of concurrency of the angle bisectors of a triangle is the _____.

circumcenter

centroid

incenter

orthocenter

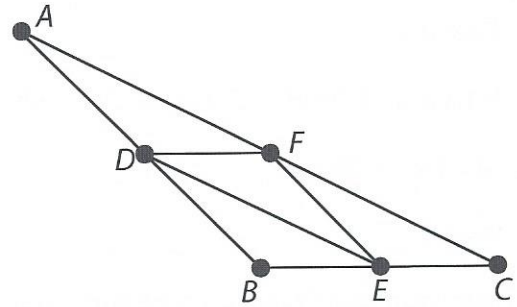
3. Given: $\overline{DE}$, $\overline{EF}$, and $\overline{DF}$ are midsegments of $\triangle ABC$.

Finish the following:

Then $\overline{AB} \parallel$ _____, $\overline{BC} \parallel$ _____, $\overline{AC} \parallel$ _____

$\overline{AD} \cong$ _____ $\cong$ _____, $\overline{DF} \cong$ _____ $\cong$ _____

$\overline{FC} \cong$ _____ $\cong$ _____



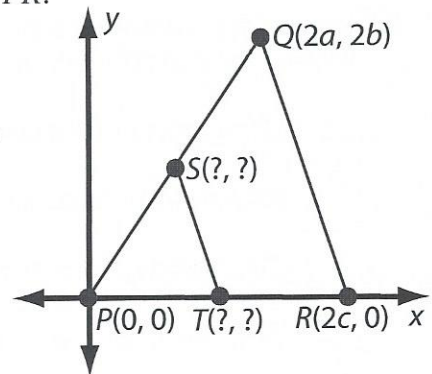
4. Find the coordinates of midpoint S of $\overline{PQ}$ and midpoint T of $\overline{PR}$.

Then find the slope of $\overline{QR}$ and $\overline{ST}$.

$S =$ (_____, _____) $T =$ (_____, _____)

slope $\overline{QR} =$

slope $\overline{ST} =$



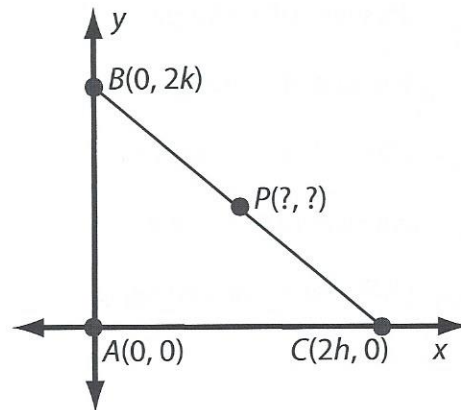
5. Find the coordinates of midpoint P of $\overline{BC}$.
Then calculate lengths AP , BP , and CP .

$P =$ (_____, _____)

$AP =$

$BP =$

$CP =$



Circle the correct answers below.

Is point P the circumcenter of $\triangle ABC$? Yes No

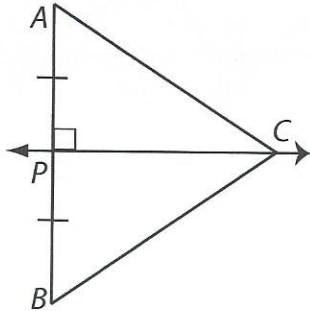
Is point A on the perpendicular bisector of $\overline{BC}$? Always Never Sometimes

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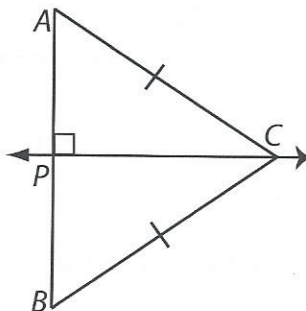
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6. Indicate whether the information on each diagram allows you to reach the given conclusion.
(Circle Yes or No)



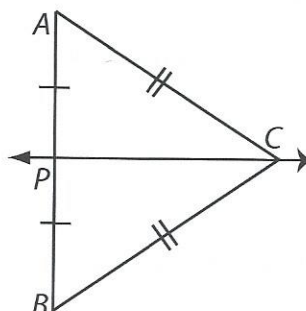
$$\overline{AC} \cong \overline{BC} ?$$

Yes No



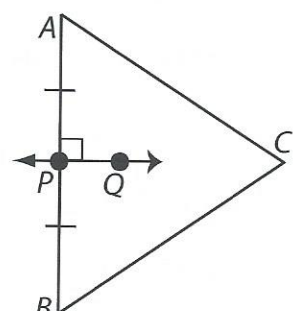
$$\overline{AP} \cong \overline{BP} ?$$

Yes No



$$\overline{PC} \perp \overline{AB} ?$$

Yes No

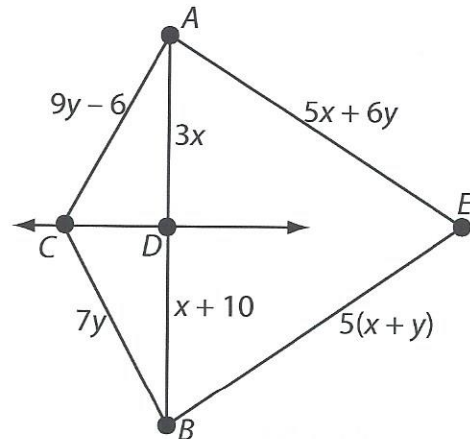


$$C \text{ lies on } \overleftrightarrow{PQ} ?$$

Yes No

7. $\overleftrightarrow{CD}$ is the perpendicular bisector of $\overline{AB}$.
Find the lengths AC , AD , and AE .

$$AC = \underline{\hspace{2cm}} \quad AD = \underline{\hspace{2cm}} \quad AE = \underline{\hspace{2cm}}$$



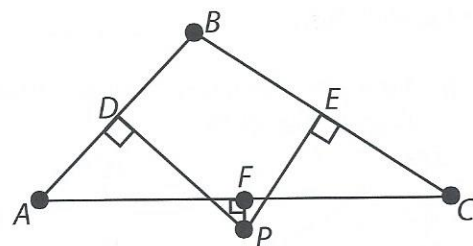
Is point E on $\overleftrightarrow{CD}$? (Answer yes or no and explain.)

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Items 8-9: Use the diagram to the right.

8. The perpendicular bisectors of $\triangle ABC$ meet at point P .
If $AB = 6$, $BE = 4$, and $BP = 7$, then

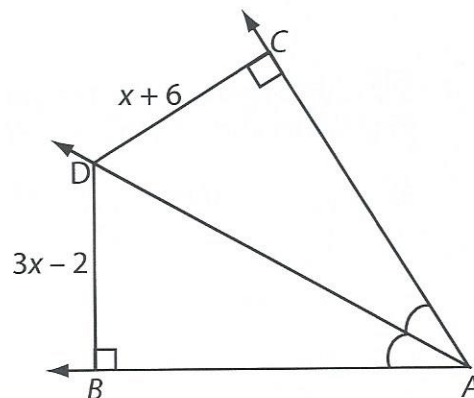
$AD = \underline{\hspace{1cm}}$, $BC = \underline{\hspace{1cm}}$, and $AP = \underline{\hspace{1cm}}$.



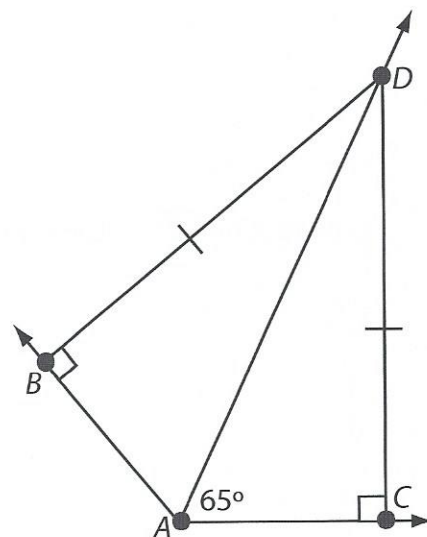
9. $\triangle ABC$ is .

acute right obtuse (Circle your answer and explain why.)

10. Find CD .



11. Find $m\angle BAC$.



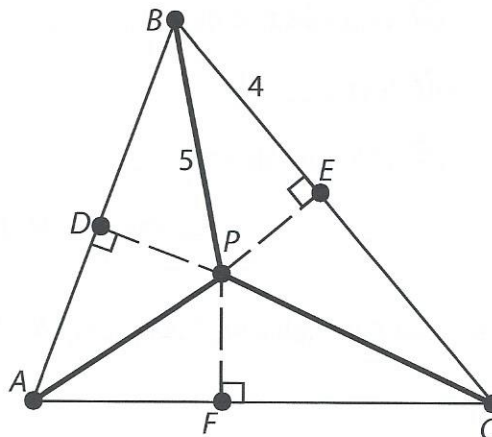
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Items 12-13: Use the diagram to the right.

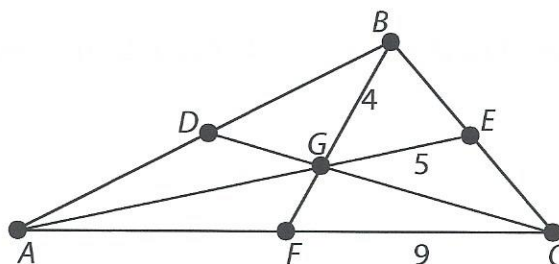
12. Point P is the incenter of $\triangle ABC$. Find DP .



13. Circle the following statement which is NOT true.

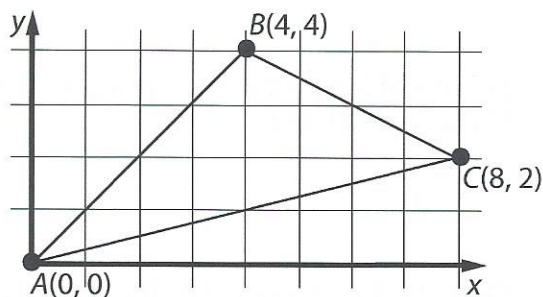
$$m\angle FCP = m\angle ECP \quad DP = FP \quad AP = CP$$

14. G is the centroid of $\triangle ABC$.
Find GF , AF , and AE .



15. Find the coordinates of the centroid M for $\triangle ABC$ shown to the right.

$$M = (\rule{1cm}{0.4pt}, \rule{1cm}{0.4pt})$$



16. Circle the item which is located outside of the triangle.

circumcenter of a right triangle

incenter of an obtuse triangle

centroid of an acute triangle

orthocenter of an obtuse triangle

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17. Complete the following statements.

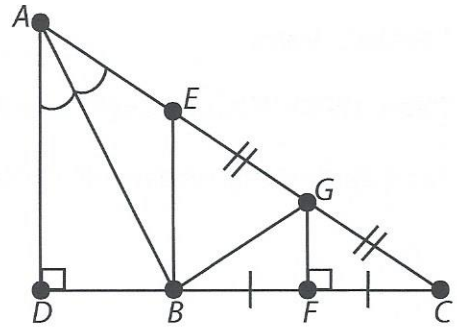
_____ is an altitude of $\triangle ABC$.

$\overline{GF}$ is an altitude of _____.

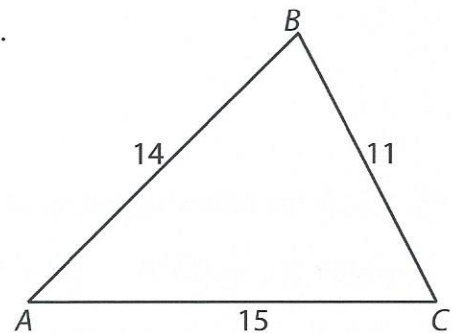
$\overline{AB}$ is an _____ of $\angle DAC$.

$\overline{BG}$ is a median of $\triangle$ _____.

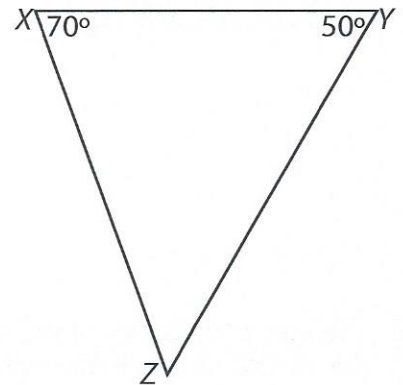
_____ is a perpendicular bisector of segment _____.



18. List the angles of $\triangle ABC$ in order from smallest to largest.

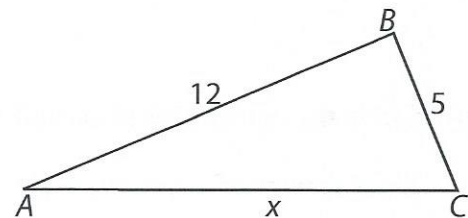


19. List the sides of $\triangle XYZ$ in order from smallest to largest.



20. Is it possible to construct a triangle with sides 4, 5, 9?
If not, explain why.

21. Describe the range of possible values of x in $\triangle ABC$.

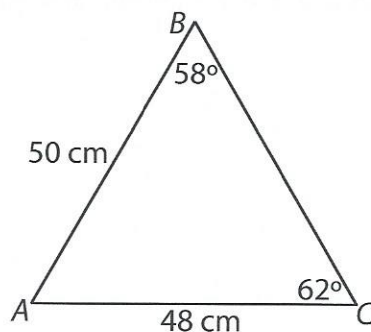


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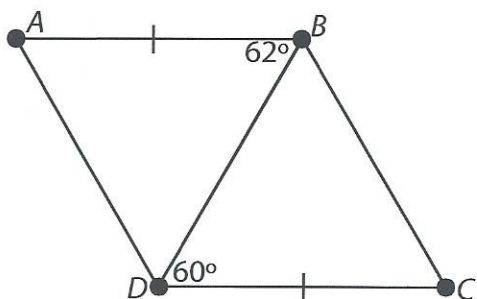
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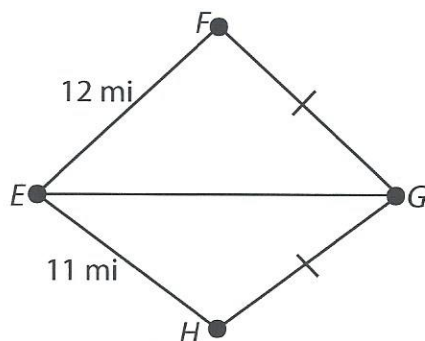
22. Use the Triangle Inequality Theorem to give a general range of values for length BC .



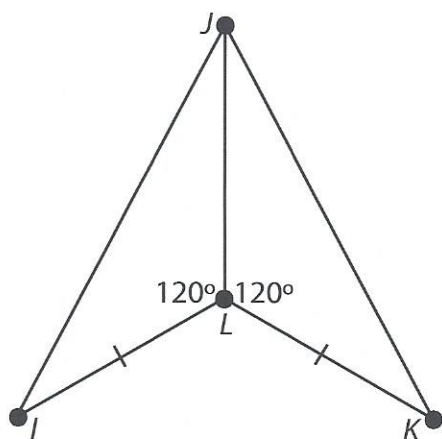
23. Complete each statement by filling the blank with $<$, $>$, or $=$.



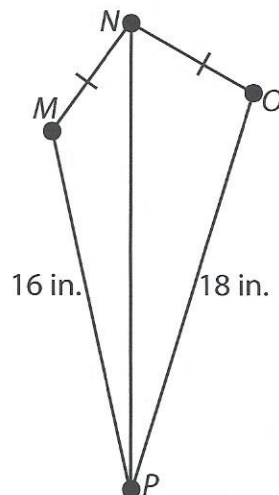
AD ___ BC



$m\angle EGF$ ___ $m\angle EGH$



IJ ___ KJ



$m\angle MNP$ ___ $m\angle ONP$

(over)

24. Given: In triangle ABC , $\angle A = 135^\circ$.
Prove: $\angle B \neq 45^\circ$ (Write an indirect proof.)

FILL IN YOUR NAME AND THE OTHER REQUIRED INFORMATION ON EACH PAGE OF THE EXAM AND MAIL THE EXAM TO AMERICAN SCHOOL.