

Geometry Honors - Review 5.1 to 5.4

NAME: Key

Write an equation in point-slope form for the perpendicular bisector of the segment with the given endpoints:

① A(2,3), V(6,9)
 $x_1, y_1 \quad x_2, y_2$

$$m = \frac{9-3}{6-2} = \frac{6}{4} = \frac{3}{2}$$

⊥ Slope $-\frac{2}{3}$

M. pt = (4, 6)

$$\underline{y - 6 = -\frac{2}{3}(x - 4)}$$

② B(-2,6), K(4,3)
 $x_1, y_1 \quad x_2, y_2$

$$m = \frac{3-6}{4-(-2)} = \frac{-3}{6} = -\frac{1}{2}$$

⊥ Slope = 2

M. pt = (1, 4.5)

$$\underline{y - 4.5 = 2(x - 1)}$$

Find the centroid of the triangle with the given vertices:

③ A(1,2), B(6,9), C(11,1)

$$\left(\frac{1+6+11}{3}, \frac{2+9+1}{3} \right)$$

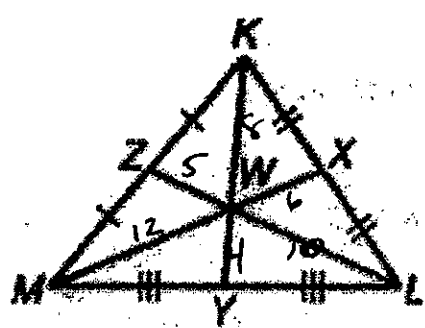
(6, 4)

④ D(-5,-8), E(0,8), F(8,3)

$$\left(\frac{-5+0+8}{3}, \frac{-8+8+3}{3} \right)$$

(1, 1)

5



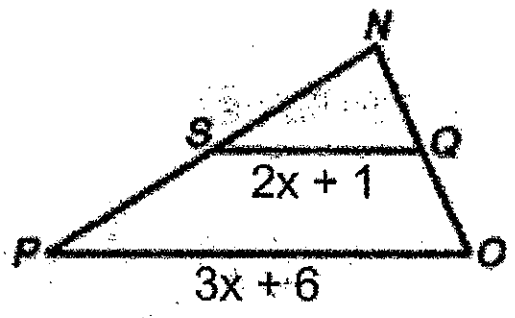
If $MX = 18$, $ZW = 5$ and $KW = 8$

Find:

| | |
|----|----|
| MW | 12 |
| WX | 6 |
| WL | 10 |
| ZL | 15 |
| WY | 4 |
| KY | 12 |

6

\overline{SQ} is a midsegment of $\triangle NOP$. What is the length of \overline{OP} ?



$$2(2x + 1) = 3x + 6$$

$$4x + 1 = 3x + 6$$

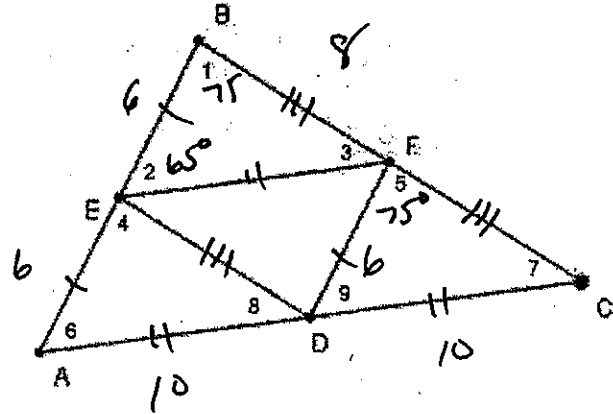
$$x = 5$$

$$3(5) + 6$$

$$OP \quad \underline{21}$$

7

Given: D is a midpoint of segment AC.
 E is a midpoint of segment AB.
 F is a midpoint of segment BC.
 Angle 2 measures 65 degrees.
 Angle 5 measures 75 degrees.
 Segment BF measures 8 units.
 Segment AC measures 20 units.
 Segment FD measures 6 units.



Find the following measures:

Angles:

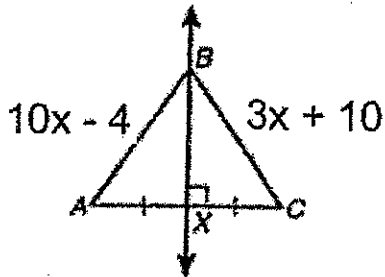
| | | | | | |
|---|------------|---|------------|---|------------|
| 1 | 75° | 2 | 65° | 3 | 40° |
| 4 | 75° | 5 | 75° | 6 | 65° |
| 7 | 40° | 8 | 40° | 9 | 65° |

Segments:

| | | | | | |
|----|----|----|----|----|----|
| AB | 12 | BC | 16 | AC | 20 |
| BE | 6 | BF | 8 | FE | 10 |
| DE | 8 | DF | 6 | FC | 8 |

8

Find AB.



$$10x - 4 = 3x + 10$$

$$7x = 14$$

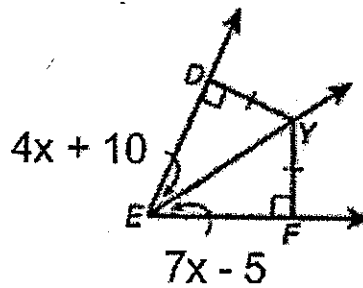
$$x = 2$$

$$10(2) - 4$$

$$AB = \underline{16}$$

9

Find $m\angle DEY$.



$$4x + 10 = 7x - 5$$

$$15 = 3x$$

$$x = 5$$

$$4(5) + 10$$

$$m\angle DEY = \underline{30^\circ}$$

(STUDY GUIDE)
PART 1

Name: Key
Date: _____

CIRCUMCENTER

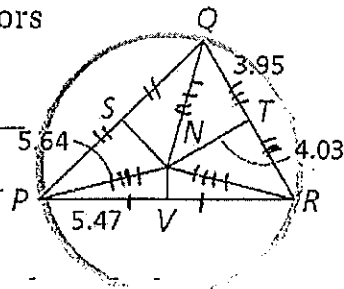
\overline{SN} , \overline{TN} , and \overline{VN} are the perpendicular bisectors of $\triangle PQR$. Find each length.

3. NR 5.64

4. RV 5.47

5. TR 3.94

6. QN 5.64

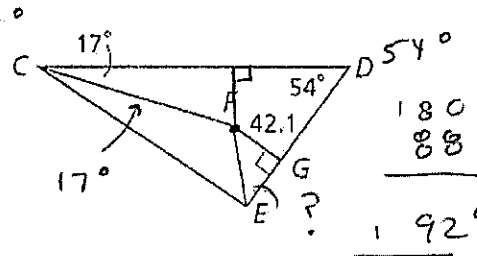


INCENTER

\overline{CF} and \overline{EF} are angle bisectors of $\triangle CDE$. Find each measure.

9. the distance from F to \overline{CD} 42.1

10. $m\angle FED$ 46°



CIRCUMCENTER

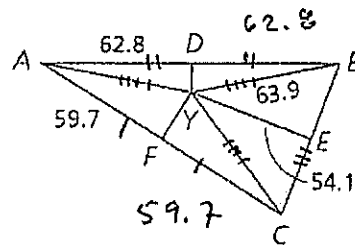
\overline{DY} , \overline{EY} , and \overline{FY} are the perpendicular bisectors of $\triangle ABC$. Find each length.

12. CF 59.7

13. YC 63.9

14. DB 62.8

15. AY 63.9



Multi-Step Find the circumcenter of a triangle with the given vertices.

16. $M(-5, 0), N(0, 14), O(0, 0)$

17. $O(0, 0), V(0, 19), W(-3, 0)$

Right ΔS

$(-2.5, 7)$

$(-1.5, 9.5)$

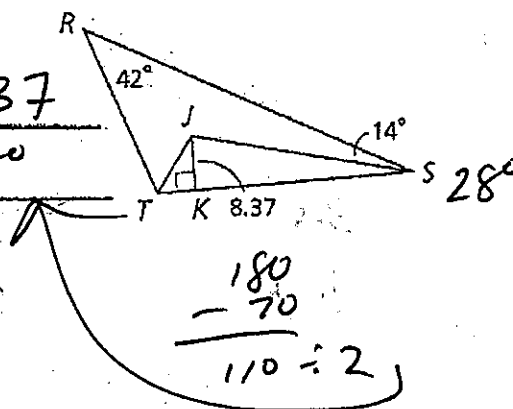
\overline{TJ} and \overline{SJ} are angle bisectors of ΔRST .
 Find each measure.

18. the distance from J to \overline{RS}

8.37

19. $m\angle RTJ$

55°



A music company has stores at $A(0, 0)$, $B(8, 0)$, and $C(4, 3)$, where each unit of the coordinate plane represents one mile.

$(4, -7/6)$

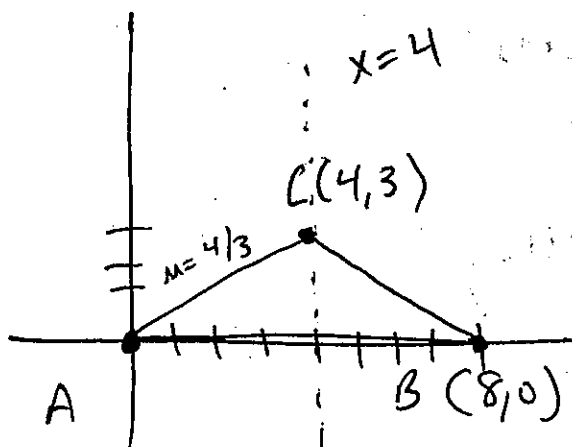
outside

4.2 mi

a. A new store will be built so that it is equidistant from the three existing stores. Find the coordinates of the new store's location.

b. Where will the new store be located in relation to ΔABC ?

c. To the nearest tenth of a mile, how far will the new store be from each of the existing stores?



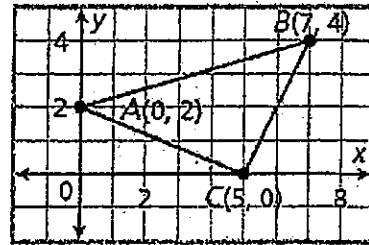
Circumcenter!

\perp slope $-\frac{3}{4}$

Midpt $(2, 1.5)$

$4 - 1.5 = \frac{-3}{4}(x - 2)$
 2.5 = $\frac{-3}{4}(x - 2)$
 5 = $-3(x - 2)$
 5 = $-3x + 6$
 $-1 = -3x$
 $x = \frac{1}{3}$

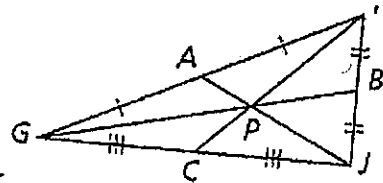
7. **Design** The diagram shows a plan for a piece of a mobile. A chain will hang from the centroid of the triangle. At what coordinates should the artist attach the chain?



(4, 2)

$PA = 2.9$, and $HC = 10.8$. Find each length.

12. PC 3.6 13. HP 7.2
14. JA 8.7 15. JP 5.8



16. **Design** In the plan for a table, the triangular top has coordinates $(0, 10)$, $(4, 0)$, and $(8, 14)$. The tabletop will rest on a single support placed beneath it. Where should the support be attached so that the table is balanced?

↳ centroid!

(4, 8)

$$\left(\frac{x_1 + x_2 + x_3}{3}, \frac{y_1 + y_2 + y_3}{3} \right)$$

$$\left(\frac{0 + 4 + 8}{3}, \frac{10 + 0 + 14}{3} \right)$$

STUDY GUIDE PART I

Name: _____

Date: _____

Algebra Find the centroid of a triangle with the given vertices.

27. $A(0, -4), B(14, 6), C(16, -8)$

AVERAGE (x, y)

$$\frac{30}{3} \quad -\frac{6}{3}$$

$(10, -3)$

28. $X(8, -1), Y(2, 7), Z(5, -3)$

AVERAGE (x, y)

$$\frac{15}{3} \quad \frac{3}{3}$$

$(5, 1)$

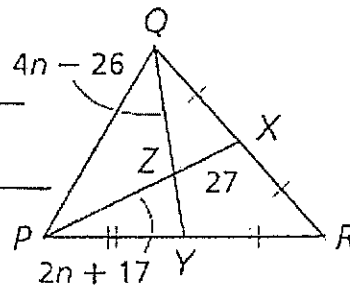
Find each length. (CENTROID)

29. PZ 54

30. PX 81

31. QZ 48

32. YZ 24



$$\begin{array}{r} 4 \\ 54 \\ 17 \\ \hline 37 \end{array}$$

$$2(27) = 2n + 17 \quad \frac{PZ}{2(18.5) + 17}$$

$$37 \quad 54 - 2n + 17 \quad 37 + 17$$

$$18.5 = 2n \quad 54$$

$$37 = 2n$$

$$\underline{n = 18.5}$$

$$\text{OR } 2(27) = 54$$

$$\frac{PX}{3(27) = 81}$$

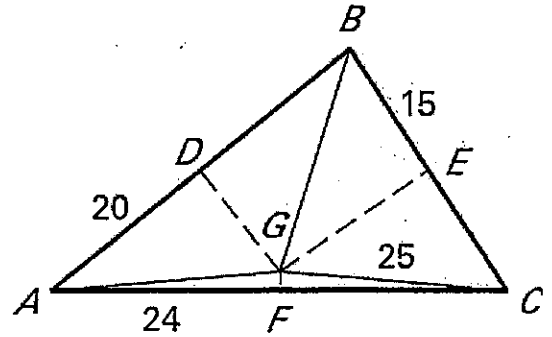
$$QZ = 4(18.5) - 26$$

$$QZ = 74 - 26 = 48$$

$$YZ = \frac{1}{2} QZ = \frac{1}{2}(48) = 24$$

In the diagram, the perpendicular bisectors (shown with dashed segments) of $\triangle ABC$ meet at point G —the circumcenter. and are shown dashed. Find the indicated measure.

11. $AG =$ 25 12. $BD =$ 20
 13. $CF =$ 24 14. $AB =$ 40
 15. $CE =$ 15 16. $AC =$ 48
 17. $m\angle ADG =$ 90°



18. If $BG = (2x - 15)$, find x .

$\hookrightarrow 25$

$2x - 15 = 25$

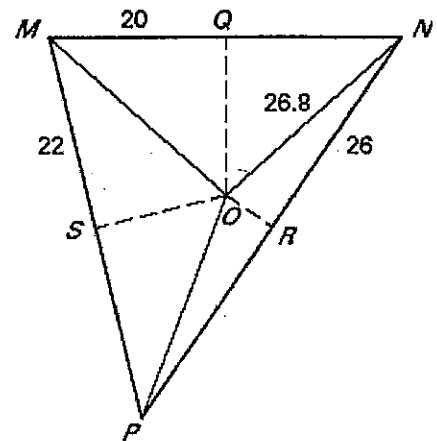
$2x = 40$

$x = 20$

$x =$ 20

In the diagram, the perpendicular bisectors (shown with dashed segments) of $\triangle MNP$ meet at point O —the circumcenter. Find the indicated measure.

19. $MO =$ 26.8 20. $PR =$ 26
 21. $MN =$ 40 22. $SP =$ 22
 23. $m\angle MQO =$ 90°



24. If $OP = 2x$, find x .

$2x = 26.8$

$x =$ 13.4