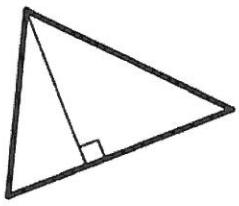
Name: AK Period: _____ Date: _____

6.2 Incenter and Circumcenter Practice Problems

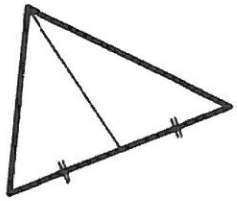
Circle the letter with the name of the segment/line/ray shown.

1.



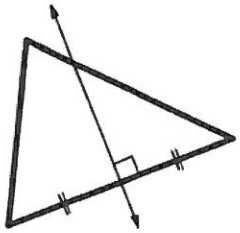
(a) perpendicular bisector
(b) angle bisector
(c) median
(d) altitude

2.



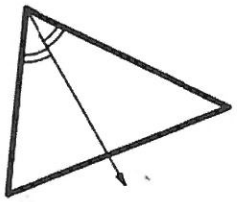
(a) perpendicular bisector
(b) angle bisector
(c) median
(d) altitude

3.



(a) perpendicular bisector
(b) angle bisector
(c) median
(d) altitude

4.



(a) perpendicular bisector
(b) angle bisector
(c) median
(d) altitude

5. Each angle bisector meets at the point of concurrency called the incenter.

6. Each perpendicular bisector meets at the point of concurrency called the circumcenter.

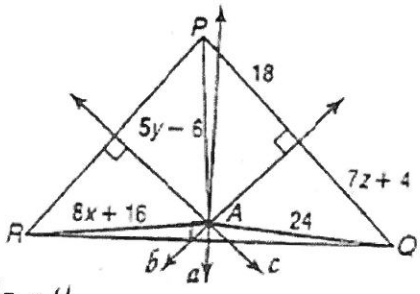
7. It is equidistant from the three vertices of the triangle.

(a) circumcenter (b) incenter (c) centroid (d) orthocenter

It is equidistant from the three sides of the triangle.

(a) circumcenter (b) incenter (c) centroid (d) orthocenter

ALGEBRA Lines *a*, *b*, and *c* are perpendicular bisectors of $\triangle PQR$ and meet at *A*.



8. Find *x*. $x = 1$

9. Find *y*. $y = 6$

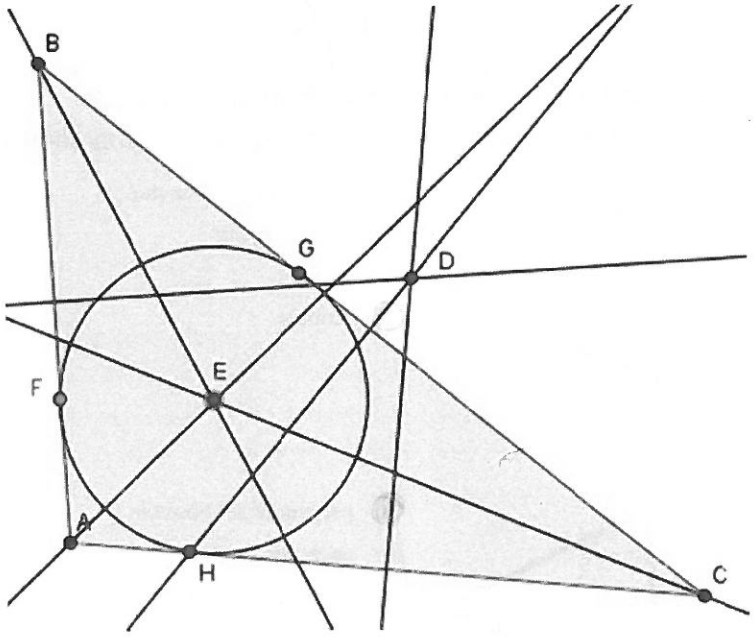
10. Find *z*. $z = 2$

$8x + 16 = 24$
$8x = 8$
$x = 1$

$5y - 6 = 24$
$5y = 30$
$y = 6$

$18 = 7z + 4$
$14 = 7z$
$2 = z$

Use the picture on the right for 11-13.
Rays AE, BE, and CE are angle bisectors.
D is the intersection of the perpendicular bisectors.



11) FE = 6x – 7, EH = 35, find EG.

$6x-7=35$

$6x=42$

$x=7$

12) AD = 3x + 4y, CD = 9x + y, BD = 11, find x and y.

$3x+4y=11$

$9x+y=11$ $\times -3$

$-9x-12y=-33$

$-11y=-22$

$y=2$

$9x+2=11$

$9x=9$

$x=1$

13) Angle FAE = 10x + 5y, Angle HAE = 10y + 5, BD = x + y, CD = 3x – 1, Find DC and angle FAH.

$10x+5y=10y+5$

$10x-5y=5$

$x+y=3x-1$

$1=2x-y$ $\times x$

No Sol.

Bad Problem

My Bad

14) Find the coordinates of the circumcenter of the triangle with the given vertices without using technology. Find it by writing equations of lines and finding where they intersect.

a) A(2, 6) B(8, 6) C(8, 10)

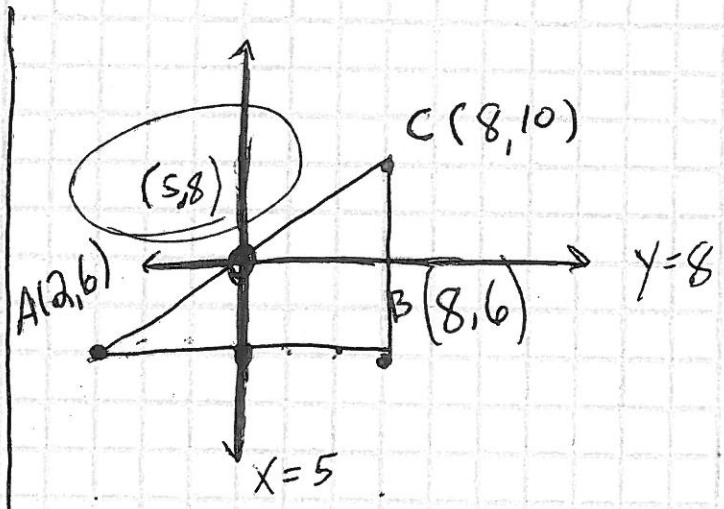
on Next page.

b) H(-10, 7) J(-6, 3) K(-2, 3)

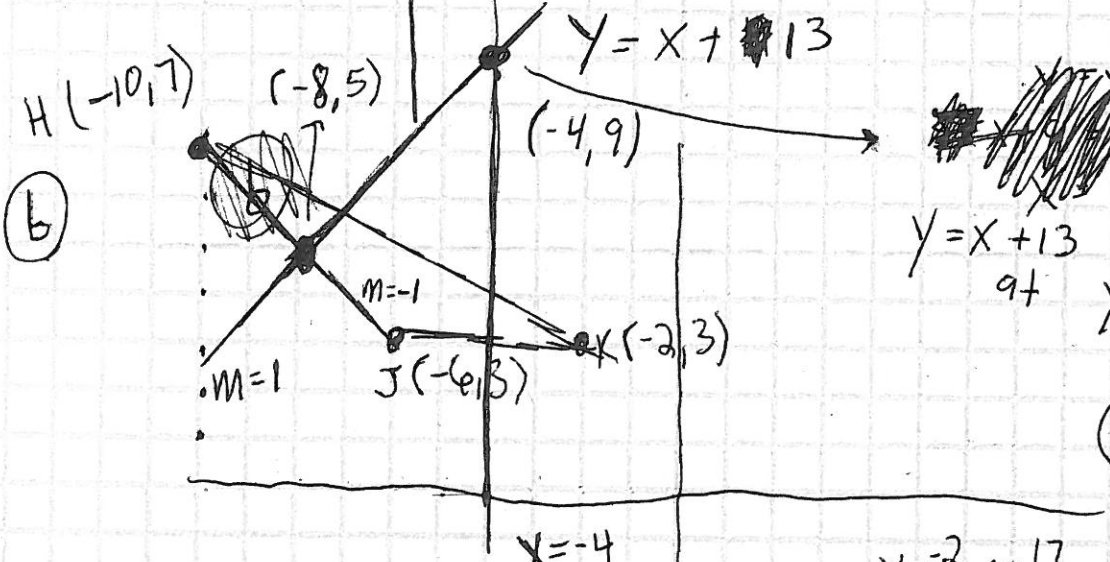
c) L(3, -6) M(5, -3) N(8, -6)

14)

(a)



(b)



$y = x + 13$ intersects with $x = -4$ at $y = -4 + 13$

$y = 9$

$(-4, 9)$

(c)

$y = \frac{-2}{3}x - \frac{17}{6}$

$y = \frac{-2}{3}\left(\frac{11}{2}\right) - \frac{17}{6}$

$y = \frac{-22}{6} - \frac{17}{6} = \frac{-39}{6}$

Intersection

$y = mx + b$

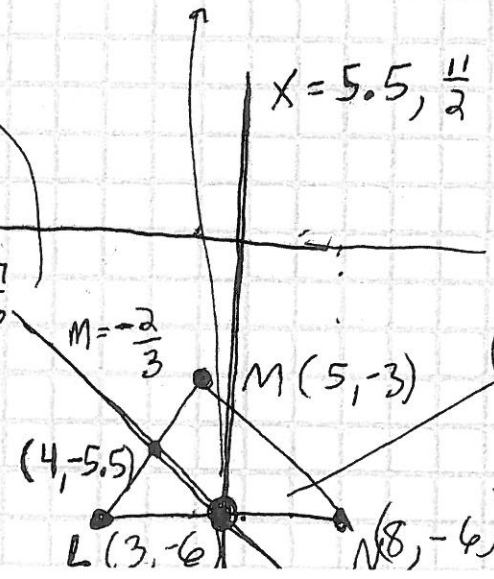
$-5.5 = -\frac{2}{3}(4) + b$

$-\frac{11}{2} = -\frac{8}{3} + b$

$-\frac{33}{6} = -\frac{16}{6} + b$

$-\frac{17}{6} = b$

$y = \frac{-2}{3}x + \frac{17}{6}$



Final Answer

$\left(\frac{11}{2}, \frac{-39}{6}\right)$