

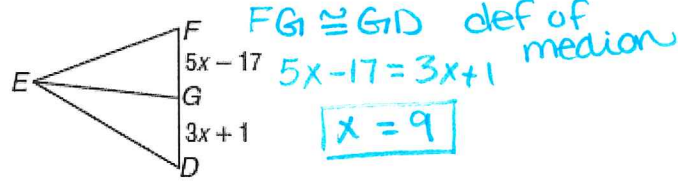
Key

# 5-1 SKILLS PRACTICE AND PRACTICE

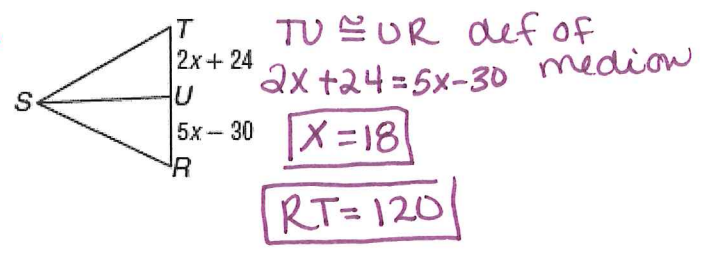
(OUT OF WORK BOOK)  
**BISECTORS, MEDIANS AND ALTITUDES (OH MY!!)**

ALGEBRA For Exercises 1-4, use the given information to find each value.

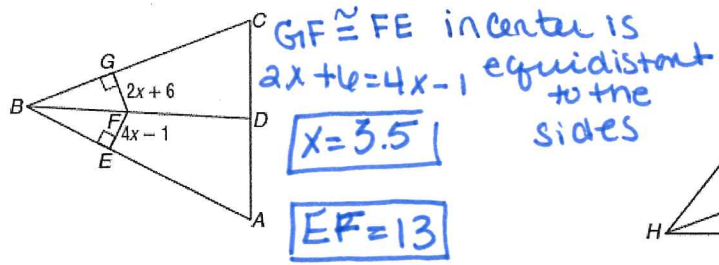
1. Find  $x$  if  $\overline{EG}$  is a median of  $\triangle DEF$ .



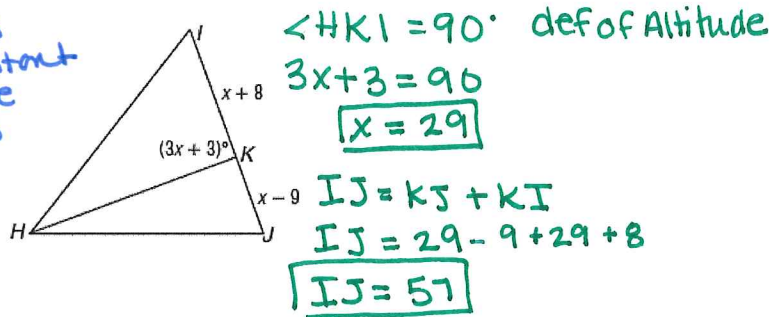
2. Find  $x$  and  $RT$  if  $\overline{SU}$  is a median of  $\triangle RST$ .



3. Find  $x$  and  $EF$  if  $\overline{BD}$  is an angle bisector.

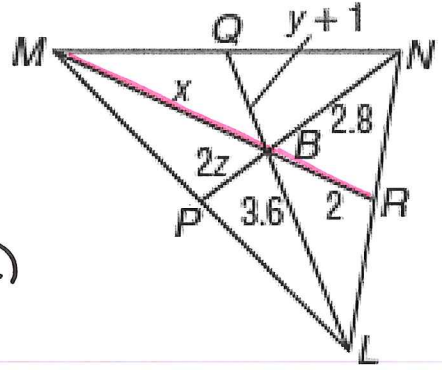


4. Find  $x$  and  $IJ$  if  $\overline{HK}$  is an altitude of  $\triangle HIJ$ .



ALGEBRA For Exercises 5-7, use the following information.

In  $\triangle LMN$ ,  $P$ ,  $Q$ , and  $R$  are the midpoints of  $\overline{LM}$ ,  $\overline{MN}$ , and  $\overline{LN}$ , respectively.



5. Find  $x$ .

$MB = 2BR$   
 $MB = 2(2.8)$   
 $MB = 4$

6. Find  $y$ .

$BL = 2QB$   
 $3.6 = 2(y+1)$   
 $3.6 = 2y+2$   
 $0.8 = y$

7. Find  $z$ .

$NB = 2PB$   
 $2.8 = 2(2z)$   
 $2.8 = 4z$   
 $0.7 = z$

This is all Centroid theorem

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

8. Find  $x$ .

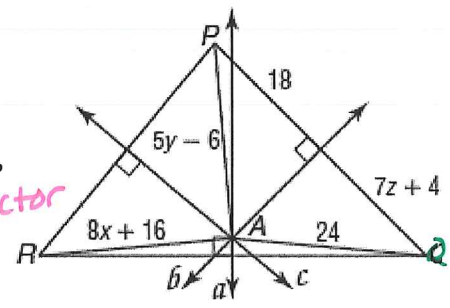
$AR \cong AQ$   
 $8x+16 = 24$   
 $x = 1$

9. Find  $y$ .

$PA \cong AQ$   
 $5y-6 = 24$   
 $y = 6$

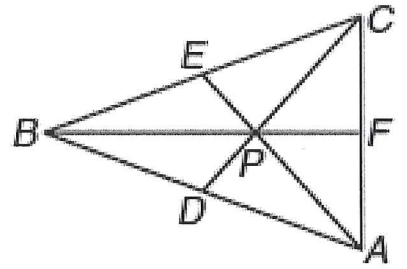
10. Find  $z$ .

def of  $\perp$  bisector  
 $7z+4 = 18$   
 $z = 2$



Circumcenter is equidistant to the vertices.

**ALGEBRA** In  $\triangle ABC$ ,  $\overline{BF}$  is the angle bisector of  $\angle ABC$ ,  $\overline{AE}$ ,  $\overline{BF}$ , and  $\overline{CD}$  are medians, and  $P$  is the centroid.



1. Find  $x$  if  $DP = 4x - 3$  and  $CP = 30$ .

$$CP = 2DP \quad \text{Centroid theorem}$$

$$30 = 2(4x - 3)$$

$$\boxed{4.5 = x}$$

2. Find  $y$  if  $AP = y$  and  $EP = 18$ .

$$AP = 2EP \quad \text{Centroid theorem}$$

$$y = 2 \cdot 18$$

$$\boxed{y = 36}$$

3. Find  $z$  if  $FP = 5z + 10$  and  $BP = 42$ .

$$BP = 2FP \quad \text{Centroid theorem}$$

$$42 = 2(5z + 10)$$

$$\boxed{z = 2.2}$$

4. If  $m\angle ABC = x$  and  $m\angle BAC = m\angle BCA = 2x - 10$ , is  $\overline{BF}$  an altitude? Explain.

$$\angle ABC + \angle BAC + \angle BCA = 180 \quad \Delta \text{ sum thm}$$

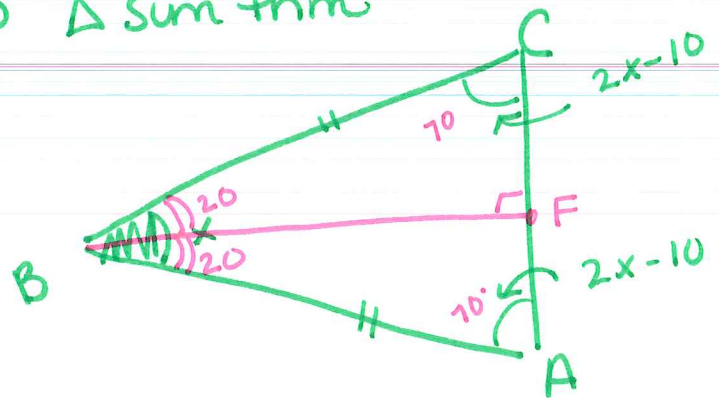
$$x + 2x - 10 + 2x - 10 = 180$$

$$5x - 20 = 180$$

$$+20 \quad +20$$

$$5x = 200$$

$$\boxed{x = 40}$$



$\overline{BF}$  must be an altitude because if  $\angle FBC = 20^\circ$  and  $\angle C = 70^\circ$  then by  $\Delta$  sum  $\angle BFC = 90^\circ$  making  $\overline{BF}$  the altitude.

ALGEBRA In  $\triangle PRS$ ,  $\overline{PT}$  is an altitude and  $\overline{PX}$  is a median.

5. Find  $RS$  if  $RX = x + 7$  and  $SX = 3x - 11$ .

$RX \cong SX$  def of median

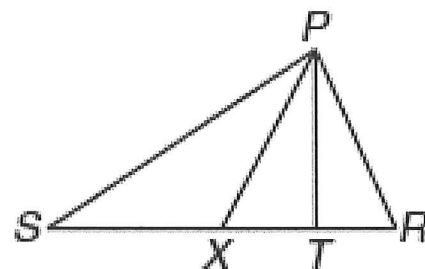
$$x + 7 = 3x - 11$$

$$\boxed{x = 9}$$

$$RS = RX + XS$$

$$RS = 9 + 7 + 3(9) - 11$$

$$\boxed{RS = 32}$$



For #5-6

6. Find  $RT$  if  $RT = x - 6$  and  $m\angle PTR = 8x - 6$ .

$\angle PTR = 90^\circ$  def of altitude

$$8x - 6 = 90$$

$$\boxed{x = 12}$$

$$RT = 12 - 6$$

$$\boxed{RT = 6}$$

ALGEBRA In  $\triangle DEF$ ,  $\overline{GI}$  is a perpendicular bisector.

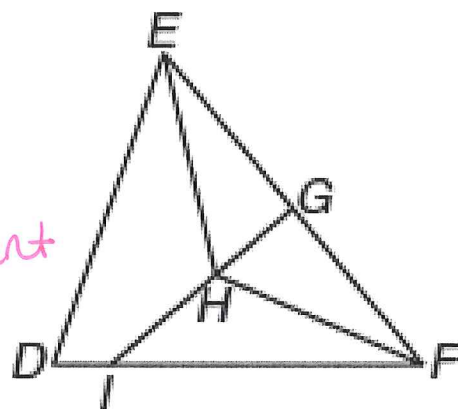
7. Find  $x$  if  $EH = 16$  and  $FH = 6x - 5$ .

$$EH \cong FH$$

$$16 = 6x - 5$$

$$\boxed{3.5 = x}$$

circumcenter is equidistant to the vertices



For #s 7-9

8. Find  $y$  if  $EG = 3.2y - 1$  and  $FG = 2y + 5$ .

$EG \cong FG$  def of perpendicular bisector

$$3.2y - 1 = 2y + 5$$

$$\boxed{y = 5}$$

this cuts into 2  $\cong$  parts.

9. Find  $z$  if  $m\angle EGH = 12z$ .

$\angle EGH = 90^\circ$  def of  $\perp$

$$12z = 90$$

$$\boxed{z = 7.5}$$