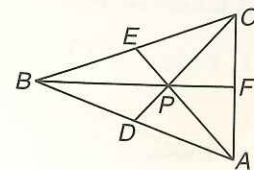


## 5-1

## Practice

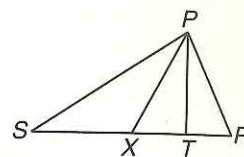
**Bisectors, Medians, and Altitudes**

**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.



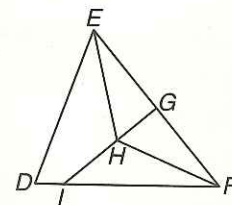
- Find  $x$  if  $DP = 4x - 3$  and  $CP = 30$ .
- Find  $y$  if  $AP = y$  and  $EP = 18$ .
- Find  $z$  if  $FP = 5z + 10$  and  $BP = 42$ .
- If  $m\angle ABC = x$  and  $m\angle BAC = m\angle BCA = 2x - 10$ , is  $\overline{BF}$  an altitude? Explain.

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



- Find  $RS$  if  $RX = x + 7$  and  $SX = 3x - 11$ .
- Find  $RT$  if  $RT = x - 6$  and  $m\angle PTR = 8x - 6$ .

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



- Find  $x$  if  $EH = 16$  and  $FH = 6x - 5$ .
- Find  $y$  if  $EG = 3.2y - 1$  and  $FG = 2y + 5$ .
- Find  $z$  if  $m\angle EGH = 12z$ .

**COORDINATE GEOMETRY** The vertices of  $\triangle STU$  are  $S(0, 1)$ ,  $T(4, 7)$ , and  $U(8, -3)$ . Find the coordinates of the points of concurrency of  $\triangle STU$ .

- orthocenter
- centroid
- circumcenter

- MOBILES** Nabuko wants to construct a mobile out of flat triangles so that the surfaces of the triangles hang parallel to the floor when the mobile is suspended. How can Nabuko be certain that she hangs the triangles to achieve this effect?

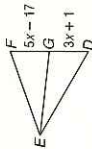
NAME \_\_\_\_\_ DATE \_\_\_\_\_ PERIOD \_\_\_\_\_

5-1 Skills Practice

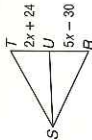
Bisectors, Medians, and Altitudes

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  $\triangle RST$ .

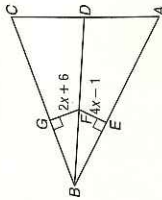


$x = 9$

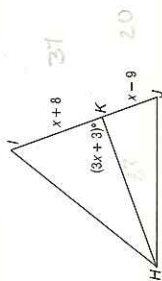


$x = 18; RT = 120$

3. Find  $x$  and  $EF$  if  $\overline{BD}$  is an angle bisector. 4. Find  $x$  and  $IJ$  if  $\overline{HK}$  is an altitude of  $\triangle HIJ$ .



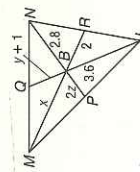
$x = 3.5; EF = 13$



$x = 29; IJ = 57$

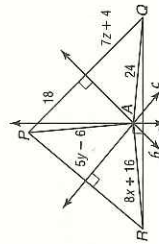
ALGEBRA For Exercises 5-7, use the following information. In  $\triangle LMN$ ,  $P$ ,  $Q$ , and  $R$  are the midpoints of  $\overline{LM}$ ,  $\overline{MN}$ , and  $\overline{LN}$ , respectively.

5. Find  $x$ . 4  
6. Find  $y$ . 0.8  
7. Find  $z$ . 0.7



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

8. Find  $x$ . 1  
9. Find  $y$ . 6  
10. Find  $z$ . 2



COORDINATE GEOMETRY The vertices of  $\triangle HIJ$  are  $G(1, 0)$ ,  $H(6, 0)$ , and  $I(3, 6)$ . Find the coordinates of the points of concurrency of  $\triangle HIJ$ .

11. orthocenter  $(3, 1)$   
12. centroid  $(\frac{10}{3}, 2)$

13. circumcenter  $(\frac{7}{2}, \frac{5}{2})$

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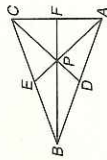
Glencoe Geometry

5-1 Practice (Average)

Bisectors, Medians, and Altitudes

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.

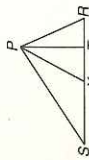
1. Find  $x$  if  $DP = 4x - 3$  and  $CP = 30$ . 4.5  
2. Find  $y$  if  $AP = y$  and  $EP = 18$ . 36  
3. Find  $z$  if  $FP = 5z + 10$  and  $BP = 42$ . 2.2



4. If  $m\angle ABC = x$  and  $m\angle BCA = 2x - 10$ , is  $\overline{BF}$  an altitude? Explain. Yes; since  $x = 40$  and  $\overline{BF}$  is an angle bisector, it follows that  $m\angle BAF = 70$  and  $m\angle ABF = 20$ . So  $m\angle AFB = 90$ , and  $\overline{BF} \perp \overline{AC}$ .

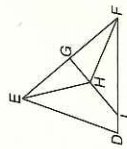
ALGEBRA In  $\triangle PRS$ ,  $\overline{PT}$  is an altitude and  $\overline{PX}$  is a median.

5. Find  $RS$  if  $RX = x + 7$  and  $SX = 3x - 11$ . 32  
6. Find  $RT$  if  $RT = x - 6$  and  $m\angle PTR = 8x - 6$ . 6



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

7. Find  $x$  if  $EH = 16$  and  $FH = 6x - 5$ . 3.5  
8. Find  $y$  if  $EG = 3.2y - 1$  and  $FG = 2y + 5$ . 5  
9. Find  $z$  if  $m\angle EGH = 12z$ . 7.5



COORDINATE GEOMETRY The vertices of  $\triangle STU$  are  $S(0, 1)$ ,  $T(4, 7)$ , and  $U(8, -3)$ . Find the coordinates of the points of concurrency of  $\triangle STU$ .

10. orthocenter  $(\frac{5}{4}, \frac{3}{2})$   
11. centroid  $(\frac{5}{3}, \frac{5}{3})$   
12. circumcenter  $(\frac{43}{8}, \frac{7}{4})$  or  $(5.375, 1.75)$

13. MOBILES Nabuko wants to construct a mobile out of flat triangles so that the surfaces of the triangles hang parallel to the floor when the mobile is suspended. How can Nabuko be certain that she hangs the triangles to achieve this effect?

She needs to hang each triangle from its center of gravity or centroid, which is the point at which the three medians of the triangle intersect.

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