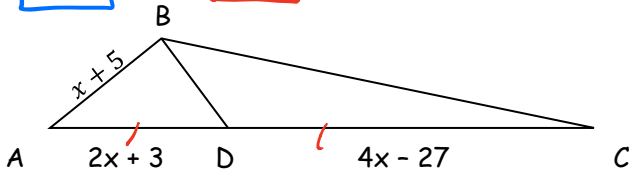


Applying Congruent Triangles – Medians, Altitudes and Bisectors

Homework Section 5.1

Name _____

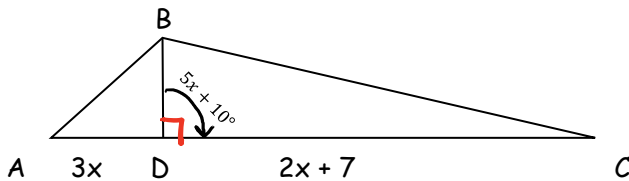
#1) Find AB if \overline{BD} is a median of $\triangle ABC$.



① $2x+3 = 4x-27$
 $3 = 2x - 27$
 $30 = 2x$
 $15 = x$

② FIND $AB = x+5$
 $= (15)+5$
 $AB = 20$

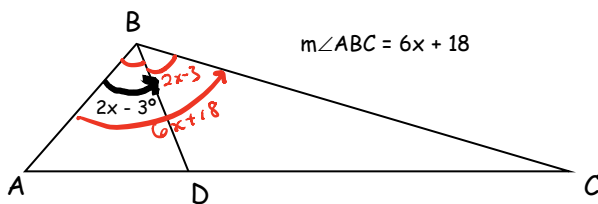
#2) Find AC if \overline{BD} is an altitude of $\triangle ABC$.



① $5x+10 = 90$
 $5x = 80$
 $x = 16$

② FIND $AC = AD+DC$
 $= 3x + (2x+7)$
 $AC = 5x+7$
 $= 5(16)+7$
 $= 80+7$
 $AC = 87$

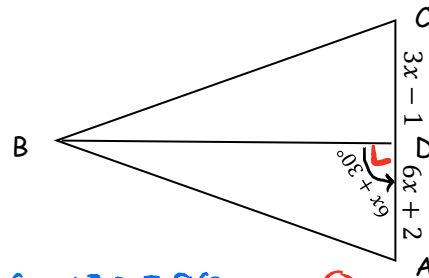
#3) Find $m\angle ABC$ if \overline{BD} is an angle bisector of $\triangle ABC$.



① $m\angle ABC = m\angle ABD + m\angle CBD$
 $6x+18 = (2x-3) + (2x-3)$
 $6x+18 = 4x-6$
 $2x+18 = -6$
 $2x = -24$
 $x = -12$

② $m\angle ABC = 6x+18$
 $= 6(-12)+18$
 $= -72+18$
 $m\angle ABC = -54$

#4) Find AC if \overline{BD} is an altitude of $\triangle ABC$.

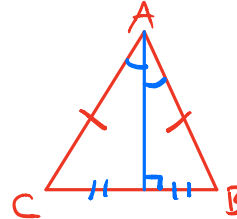


① $6x+30 = 90$
 $6x = 60$
 $x = 10$

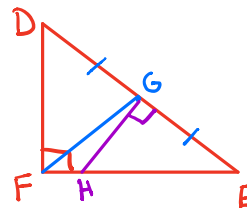
② $AC = AD+DC$
 $AC = (6x+2) + (3x-1)$
 $= 9x+1$
 $= 9(10)+1$
 $= 90+1$
 $AC = 91$

Draw and label a figure for each statement.

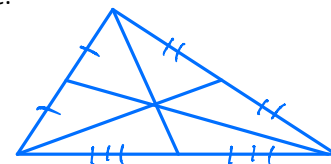
#5) Isosceles triangle ABC, with vertex angle A, where \overline{AD} is an altitude, median, and angle bisector.



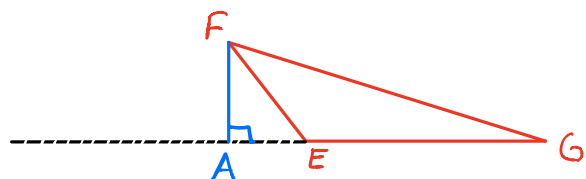
#6) $\triangle DEF$ is a right triangle with right angle at F. \overline{FG} is a median of $\triangle DEF$ and \overline{GH} is the perpendicular bisector of \overline{DE} .



#7) Three medians of a triangle intersecting in the interior of the triangle.



#8) Altitude \overline{FA} on the exterior of $\triangle EFG$.

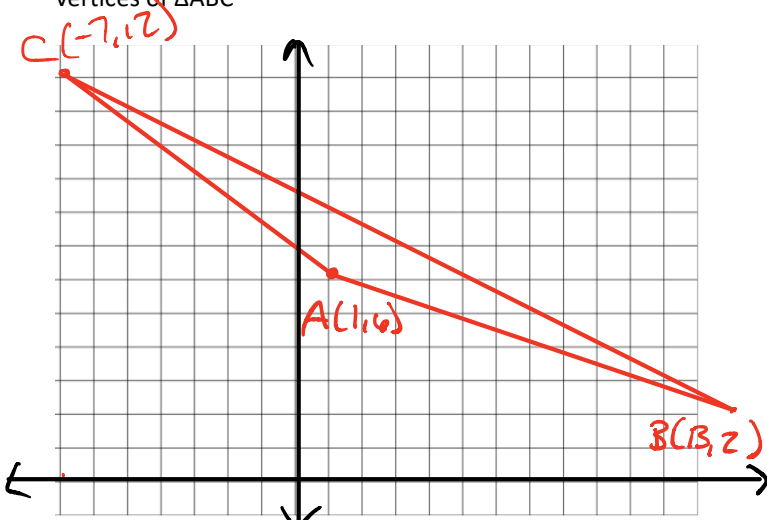


Applying Congruent Triangles – Medians, Altitudes and Bisectors

Homework Section 5.1

Name _____

Answer each question if $A(1, 6)$, $B(13, 2)$, and $C(-7, 12)$ are the vertices of $\triangle ABC$



#9) What are the coordinates of the midpoint of \overline{AB} ?

$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$M = \left(\frac{(1) + (13)}{2}, \frac{(6) + (2)}{2} \right)$$

$$M = \left(\frac{14}{2}, \frac{8}{2} \right)$$

$$M = (7, 4)$$

#10) What is the slope of the perpendicular bisector of \overline{AB} ?

$$m_{\overline{AB}} = \frac{\Delta y}{\Delta x}$$

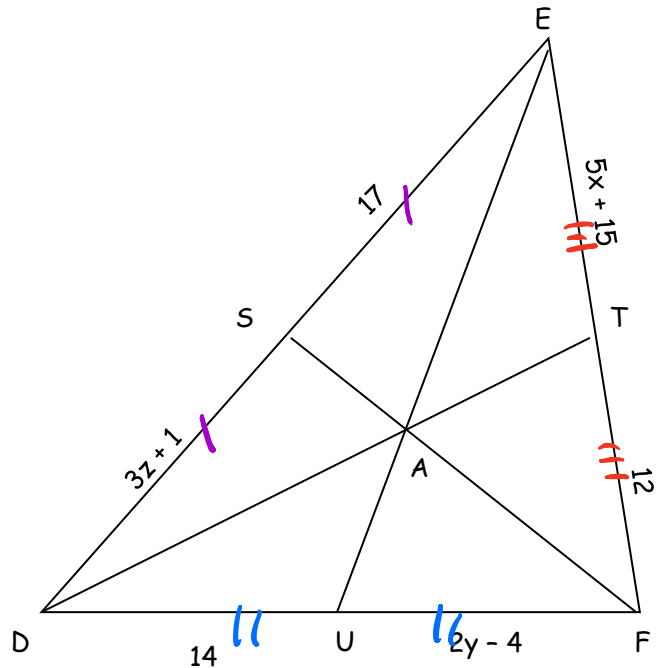
$$= \frac{(6) - (2)}{(1) - (13)}$$

$$= \frac{4}{-12}$$

$$m_{\overline{AB}} = -\frac{1}{3}$$

$$\perp m_{\overline{AB}} = 3$$

#11) Points S, T, and U are the midpoints of \overline{DE} , \overline{EF} , and \overline{DF} , respectively. Find x, y, and z.



$$5x + 15 = 12$$

$$5x = -3$$

$$x = -\frac{3}{5}$$

$$2y - 4 = 14$$

$$2y = 18$$

$$y = 9$$

$$3z + 1 = 17$$

$$3z = 16$$

$$z = \frac{16}{3}$$

- #1) 20
- #2) 87
- #3) 54
- #4) 91
- #5) - #8) See key
- #9) (7, 9)
- #10) 3
- #11) $\left(-\frac{3}{5}, 9, \frac{16}{3}\right)$