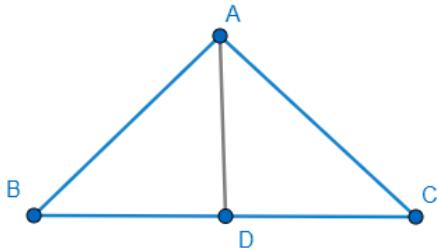


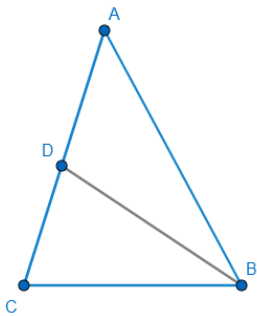
See the answers to the Practice Assignment on PAGE 3 below.

Fill in the blanks:

1. An _____ is a line or line segment that passes through the vertex of a triangle and forms a right angle with the opposite side of the triangle.
2. A _____ is a line or line segment that passes through the midpoint of a side of a triangle and is perpendicular to that side.
3. The _____ connects the vertex of a triangle to the midpoint of the opposite side.
4. An _____ goes from one vertex of a triangle to the opposite side, and cuts the angle into two equal halves.
5. AD is a median of triangle ABC. Find x if $BC = 2x - 11$ and $DC = \frac{1}{2}x$.

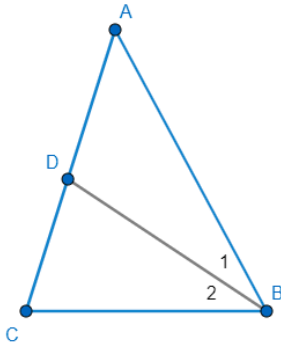


6. BD is a median of triangle ABC. Find CD if $CA = x + 2$ and $DC = 2x - 11$.



7. EX is a median of triangle WXY. Find EW if $EY = 4x - 1$ and $EW = 2x + 4$.

Use the following diagram for problems 8-10:



BD is an angle bisector of triangle ABC.

8. Find x if $m\angle 2 = 4x + 3$ and $m\angle 1 = 3x + 8$.

9. Find x if $m\angle 2 = 16x - 3$ and $m\angle ABC = 29x + 3$

10. Find $m\angle 1$ if $m\angle 1 = 5x + 2$ and $m\angle ABC = 13x - 2$.

11. RS is an altitude of triangle RTE. $m\angle SRT = 4x - 8$ and $m\angle STR = 6x + 13$. Find the value of x .

12. In triangle ABC, DE is a perpendicular bisector of AC with D on AC. If $AD = 2y + 4$, $CD = y + 12$, and $m\angle EDC = 5x - 60$, find x , y , AD, DC, and AC.

13. In triangle DEG, FH is a perpendicular bisector of DG with H on DG. If $DH = 2y + 3$, $GH = 7y - 42$, and $m\angle FHG = x^2 + 9$, find x , y , and DG.

Answers:

1. altitude

2. perpendicular bisector

3. median

4. angle bisector

5. $x = 11$

$$\begin{aligned} BD &= DC \\ BD + DC &= BC \\ \text{OR} \\ 2(DC) &= BC \\ 2x - 11 &= 2\left(\frac{1}{2}x\right) \\ 2x - 11 &= x \\ -2x &\quad -2x \\ -11 &= -x \\ \frac{-11}{-1} &= \frac{-x}{-1} \\ \boxed{x = 11} \end{aligned}$$

6. $CD = 5$

$$\begin{aligned} CA &= 2(OC) \\ x + 2 &= 2(2x - 11) \\ x + 2 &= 4x - 22 \\ -x &\quad -x \\ 24 &= 3x \\ \frac{24}{3} &= \frac{3x}{3} \\ x &= 8 \\ DC \text{ or } CD &= 2x - 11 \\ 2(8) - 11 &= 16 - 11 \\ &= \boxed{5} \end{aligned}$$

7. $EW = 9$

$$\begin{aligned} EY &= EW \\ 4x - 1 &= 2x + 4 \\ 2x &\quad -2x \\ 2x - 1 &= 4 \\ +1 &\quad +1 \\ 2x &= 5 \\ \frac{2x}{2} &= \frac{5}{2} \\ x &= 2.5 \\ EW &= 2(2.5) + 4 \\ &= 5 + 4 \\ &= \boxed{9} \end{aligned}$$

8. $x = 5$

$$\begin{aligned} m\angle 1 &= m\angle 2 \\ 4x + 3 &= 3x + 8 \\ -3x &\quad -3x \\ x + 3 &= 8 \\ -3 &\quad -3 \\ x &= 5 \\ \boxed{x = 5} \end{aligned}$$

9. $x = 3$

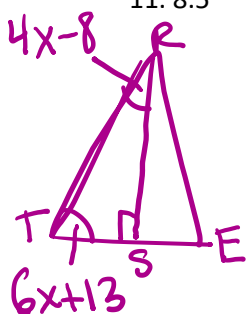
$$\begin{aligned} m\angle ABC &= 2(m\angle 2) \\ 29x + 3 &= 2(16x - 3) \\ 29x + 3 &= 32x - 6 \\ -29x &\quad -29x \\ 3 &= 3x - 6 \\ +6 &\quad +6 \\ 9 &= 3x \\ \frac{9}{3} &= \frac{3x}{3} \\ \boxed{x = 3} \end{aligned}$$

10. 12

$$\begin{aligned} m\angle ABC &= 2(m\angle 1) \\ 13x - 2 &= 2(5x + 2) \\ 13x - 2 &= 10x + 4 \\ -10x &\quad -10x \\ 3x - 2 &= 4 \\ +2 &\quad +2 \\ 3x &= 6 \\ \frac{3x}{3} &= \frac{6}{3} \\ x &= 2 \end{aligned}$$

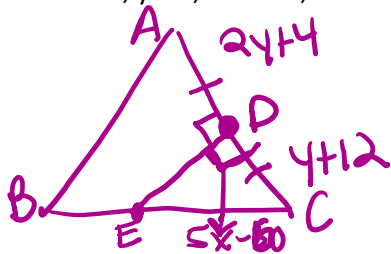
$$\begin{aligned} m\angle 1 &= 5(2) + 2 \\ &= 10 + 2 \\ \boxed{m\angle 1 = 12} \end{aligned}$$

11. 8.5



$$\begin{aligned} m\angle SRT + m\angle STR + m\angle RST &= 180^\circ \\ 4x - 8 + 6x + 13 + 90 &= 180 \\ 10x + 95 &= 180 \\ -95 &\quad -95 \\ 10x &= 85 \\ \frac{10x}{10} &= \frac{85}{10} \\ \boxed{x = 8.5} \end{aligned}$$

12. $x = 30$; $y = 8$; $AD = 20$; $DC = 20$; $AC = 40$



$$\begin{aligned} AD &= 2y+4 \\ 2(8)+4 \\ AD &= 16+4 = \boxed{20} \end{aligned}$$

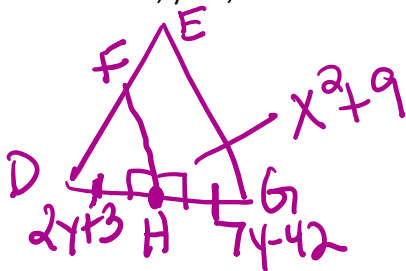
$$\begin{aligned} 2y+4 &= y+12 \\ -y & \quad -y \\ y+4 &= 12 \\ -4 & \quad -4 \\ y &= 8 \end{aligned}$$

$$\begin{aligned} AC &= 20(2) \\ &= \boxed{40} \end{aligned}$$

$$\begin{aligned} 5x-60 &= 90 \\ +60 & \quad +60 \\ 5x &= 150 \\ \div 5 & \quad \div 5 \\ x &= \boxed{30} \end{aligned}$$

$$\begin{aligned} DC &= y+12 \\ &= 8+12 \\ DC &= \boxed{20} \end{aligned}$$

13. $x = 9$; $y = 9$; $DG = 42$



$$\begin{aligned} 7y-42 &= 2y+3 \\ -2y & \quad -2y \\ 5y-42 &= 3 \\ +42 & \quad +42 \\ 5y &= 45 \\ \div 5 & \quad \div 5 \\ y &= \boxed{9} \end{aligned}$$

$$\begin{aligned} x^2+9 &= 90 \\ -9 & \quad -9 \\ x^2 &= 81 \\ \sqrt{x^2} &= \sqrt{81} \\ x &= \boxed{9} \end{aligned}$$

$$\begin{aligned} DG &= 2(DH) \\ DG &= 2(2(9)+3) \\ DG &= 2(18+3) \\ &= 2(21) = \boxed{42} \end{aligned}$$