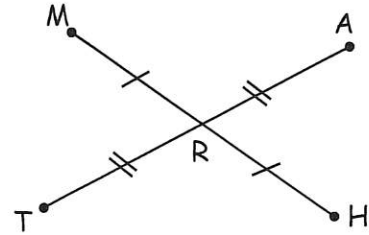


# Midpoints & Segment Bisectors

Name Key

1. Use the diagram at the right to complete the following statements.

- a)  $MR = 24$ ,  $HR = 24$     b)  $TR = 16$ ,  $AT = 32$   
 c)  $MH = 58$ ,  $MR = 29$   
 d) R is the midpoint of  $\overline{MH}$  and  $\overline{AT}$ .



2. M is the midpoint of  $\overline{PQ}$ .  $PM = 7x + 8$  and  $MQ = 5x + 20$ . Draw the diagram.

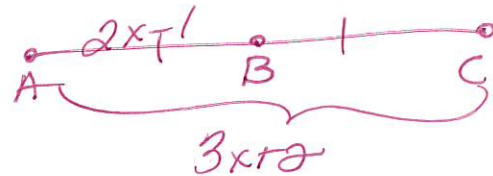


$PM = MQ$

$x = 6$     $PM = 50$     $MQ = 50$     $PQ = 100$

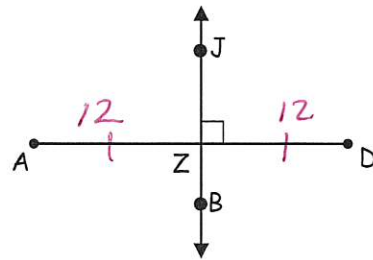
3. B is the midpoint of  $\overline{AC}$ .  $AB = 2x - 1$  and  $BC = 3x + 2$ . Draw the diagram.

$AB = BC$



$x = 4$     $AB = 7$     $BC = 7$     $AC = 14$

4. Given  $\overline{JB}$  is the segment bisector of  $\overline{AD}$ ,  $AD = 24$ ,  $AZ = 2x + 4$ , and  $m\angle JZA = 3y$ . Find the value of  $x$  and  $y$ .



$2x + 4 = 12$   
 $2x = 8$   
 $x = 4$

$AZ = \frac{1}{2}(24)$

$3y = 90$

$AZ = 12$

$y = 30$

Use Figure 2 for problems 5-7.

5. What is the midpoint of  $\overline{AB}$ ?

4 (Q)

6. What is the coordinate of the midpoint of  $\overline{QB}$ ?

$\frac{4+8}{2} = 6$

7. The coordinate of the midpoint of  $\overline{AR}$  is -5.

What is the coordinate of point R?

-10

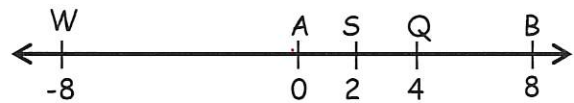


Figure 2

Use Figure 3 for problems 8 -9.

8. If  $TM = 3x + 5$ ,  $MQ = x + 17$ , find the value of  $x$ .

$$TM = MQ$$

$$3x + 5 = x + 17$$

$$x = 6$$

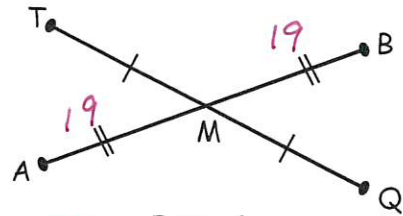


Figure 3

9. If  $AM = 5y - 1$ ,  $AB = 38$ , find the value of  $y$ .

$$AM = \frac{1}{2}(AB)$$

$$5y - 1 = 19$$

$$y = 4$$

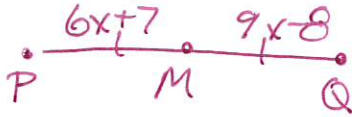
or

$$2(5y - 1) = 38$$

$$10y - 2 = 38$$

Draw a diagram for each problem.

10. M is the midpoint of  $\overline{PQ}$ .  $PM = 6x + 7$  and  $MQ = 9x - 8$ , find the length of  $PQ$ .



$$PM = MQ$$

$$6x + 7 = 9x - 8$$

$$15 = 3x$$

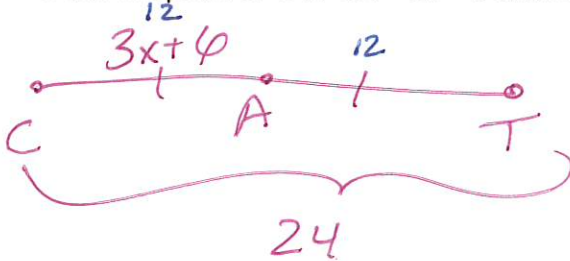
$$5 = x$$

$$PQ = 2(PM)$$

$$PQ = 2(37)$$

$$PQ = 74$$

11. A is the midpoint of  $\overline{CT}$ .  $CA = 3x + 6$  and  $CT = 24$ , find  $x$ .



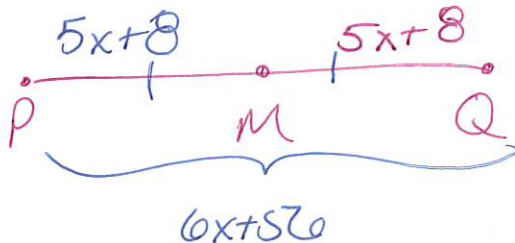
$$CA = 12$$

$$3x + 6 = 12$$

$$3x = 6$$

$$x = 2$$

12. M is the midpoint of  $\overline{PQ}$ .  $MQ = 5x + 8$  and  $PQ = 6x + 56$ , find  $PM$ .



$$10x + 16 = 6x + 56$$

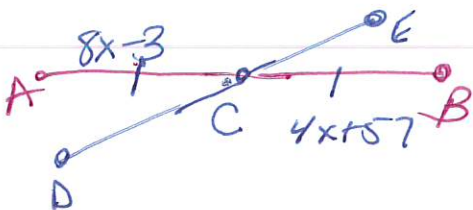
$$4x = 40$$

$$x = 10$$

$$PM = 5(10) + 8$$

$$PM = 58$$

13.  $\overline{DE}$  bisects  $\overline{AB}$  at C. If  $AC = 8x - 3$  and  $CB = 4x + 57$ , find  $x$ .



$$8x - 3 = 4x + 57$$

$$4x = 60$$

$$x = 15$$