Reasoning and Proof

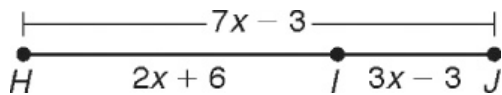*Practice and Problem Solving: A/B*

1. Given I is between HJ. Find x and HI and IJ. Set up an equation and solve for x.

$$\overset{\displaystyle 7x-3}{\underset{H \qquad 2x+6 \qquad I \;\; 3x-3 \;\; J}{\rule{0pt}{0pt}}}$$

In Exercises 2 and 3, find the measure of each angle.

2. $\angle WXY$ and $\angle YXZ$ are supplementary angles, $m\angle WXY = (6x + 59)°$, and $m\angle YXZ = (3x - 14)°$.

3. $\angle ABC$ and $\angle CBD$ are supplementary angles, $m\angle ABC = 7x°$ and $m\angle CBD = 8x°$.

4. $\angle 3$ is a supplement of $\angle 4$, and $m\angle 4 = 75°$. Find $m\angle 3$.

In Exercises 5 and 6, find the distance between the two points.
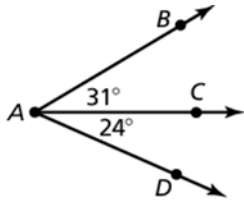
5. $Q(5, 6)$ and $P(1, 3)$ 6. $G(2, 5)$ and $H(4, -1)$

In Exercises 7 and 8, the endpoints of $\overline{LN}$ are given. Find the coordinates of the midpoint M.

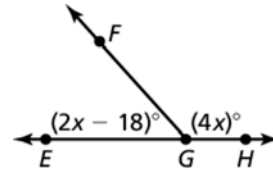7. $L(2, 1)$ and $N(2, 13)$ 8. $L(-6, 0)$ and $N(6, 6)$

In Exercises 9 and 10, find the indicated angle measure.
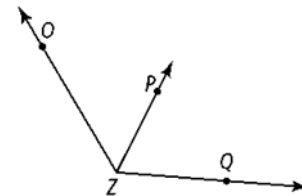
9. Find $m\angle BAD$.

10. Find x and $m\angle EGF$.

11. $m\angle OZP = 4r + 2$, $m\angle PZQ = 5r - 12$, and $m\angle OZQ = 125$. What are $m\angle OZP$ and $m\angle PZQ$?
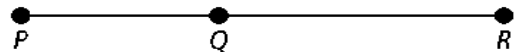
Given $\overrightarrow{QS}$ **bisects** $\angle PQR$**. Solve for** x **and find** $m\angle PQR$**.** Draw a picture and solve for x.

12. $m\angle PQS = 3x$; $m\angle SQR = 5x - 20$

13. $m\angle PQS = 2x + 1$; $m\angle RQS = 4x - 15$

For Exercises 14 –16, use the figure at the right.

14. If $PQ = 7$ and $QR = 10$, then $PR = \boxed{}$.

15. If $PQ = 20$ and $QR = 22$, then $PR = \boxed{}$.

16. If $PR = 25$ and $PQ = 12$, then $QR = \boxed{}$.

17. Point E is between points D and F. If $DE = x - 4$, $EF = 2x + 5$, and $DF = 4x - 8$, find x.

18. Y is the midpoint of $\overline{XZ}$. If $XZ = 8x - 2$ and $YZ = 2x + 1$, find x.

19. $\overrightarrow{SV}$ is an angle bisector of $\angle RST$. If $m\angle RSV = (3x + 5)°$ and $m\angle RST = (8x - 14)°$, find x.

20. $\angle ABC$ and $\angle CBD$ are a linear pair. If $m\angle ABC = m\angle CBD = 3x - 6$, find x.