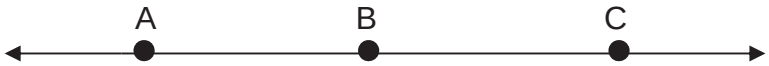
Distance and Length

_____
If a point is between two endpoints of a line segment, you can add the distance from the point to one endpoint of the line segment to the distance from the point to the other endpoint of the line segment to get the length of the line segment.

_____
If B is between A and C, then AB + BC = AC.



_____
If AB = BC and B is between A and C, then B is the midpoint of AC.

If AB = BC and B is between A and C, then B is the midpoint of AC.

If B is the midpoint of $\overline{AC}$, then $\overline{AB}$ and $\overline{BC}$ are congruent segments, because their measures are equal.

If B is the midpoint of $\overline{AC}$, then AB= (1/2) AC and BC= (1/2) AC.

A segment bisector is a segment, ray, line, or plane that intersects a line segment at its midpoint.

Guided Practice

Use the diagram above for #15 – 18.

1. If AB = 3 units and BC = 7 units, what is AC?

2. If AC = 45 units and BC = 28 units, what is AB?

3. If AB = 3x + 5, BC = 2x + 8, and AC = 88, what is the value of x?

4. If B was the midpoint of $\overline{AC}$ and AC = 16, what is the value of x when AB = 2x + 4?

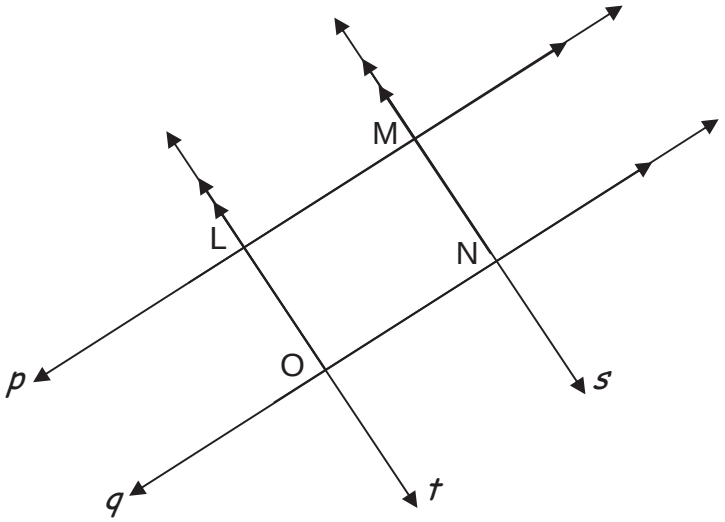
Draw a diagram of the problem and give the solution.

5. Given F is the midpoint of $\overline{EG}$. FE is 6x + 7 and EG is 18x – 4. What is the value of x?

6. $\overline{PQ}$ is bisected by $\overleftrightarrow{ST}$ at R. If PQ = 57 centimeters, how long are $\overline{PR}$ and $\overline{RQ}$?

Distance and Length

Practice Problems



Lines p and q intersect lines s and t at right angles at L, M, N, and O.

7. Name two sets of parallel lines.

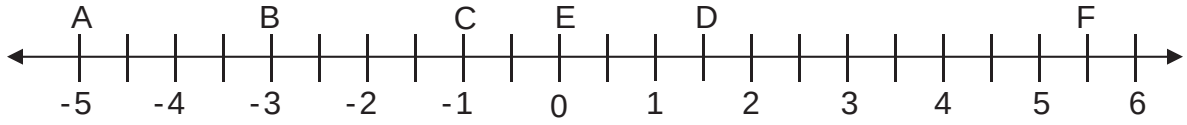
8. Name two sets of perpendicular lines.

9. Name two line segments using L, M, N, and O.

10. Name two rays using L, M, N, and O.

11. Sketch a number line to represent the following problem. Suppose $\overline{XY}$ has length 6. If X has coordinate -3, find the possible coordinates for Y graphically and symbolically.

Use the given number line to find the indicated distances.



12. AE
13. DB
14. FA
15. AC
16. ED
17. FB

For the following problems assume L is between K and M.

18. If KL = 27 units and KM = 84 units, what is LM?

19. If KL = 2x, LM = 3x –2, and KM = 43, what is the value of x?

20. If KL = 4x – 1, LM = 2x – 1, and KM = 2x, what is the value of x?

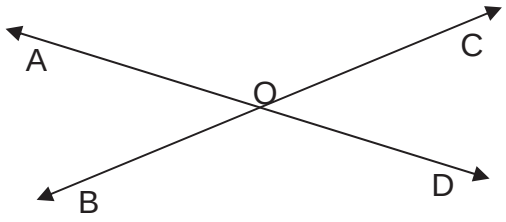
21. If L is the midpoint of $\overline{KM}$ and KM = 5x – 6 and LM = 2x + 4, what is the value of x?

All about Angles

Angle Theorems

- Vertical angles are _____.
- If two angles are supplementary to the same angle or to congruent angles, they are _____.
- If two angles are complementary to the same angle or to congruent angles, they are _____.

Examples
Use the figure to answer Problems #1-2 below.



1. If $m\angle AOC = 16x - 20$ and $m\angle BOD = 13x+7$, find the value of x and the degree measure of the two angles.

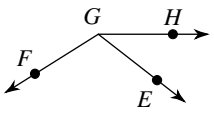
2. If $m\angle AOB = 4x + 15$ and $m\angle AOC = 3x + 25$, find the degree measures of $\angle AOB$ and $\angle AOC$.

Solve the following problems using the given information.

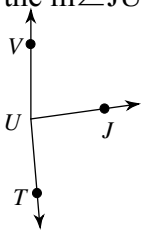
3. $\angle X$ and $\angle Y$ are complementary angles. If $m\angle X = 3x + 7$ and $m\angle Y = 6x+20$, find the value of x and the degree measure of each angle.

4. The measure of the complement of an angle is one-fourth the measure of the supplement of the angle. Find the measure of the angle.

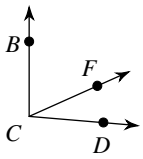
5) $m\angle HGF = 16x + 4$, $m\angle EGF = 110°$, and $m\angle HGE = 3x + 11$. Find x.



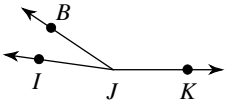
6) Ray UV bisects $\angle VUT$. $m\angle VUT = 164°$, $m\angle VUJ = 17x - 3$. Find x and the m$\angle$JUT.



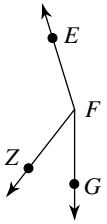
7) $m\angle FCD = x + 41$, $m\angle BCF = x + 78$, and $m\angle BCD = 95°$. Find x.



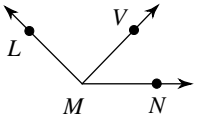
8) Find x if $m\angle BJK = 146 + 2x$, $m\angle IJK = 172°$, and $m\angle IJB = 2x + 26$.



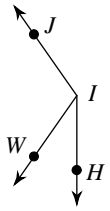
9) $m\angle GFZ = 38°$, $m\angle ZFE = 2x + 125$, and $m\angle GFE = x + 163$. Find x.



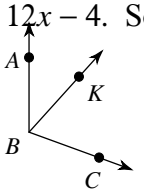
10) Find x if $m\angle LMN = 135°$, $m\angle LMV = -1 + 45x$, and $m\angle VMN = 23x$.



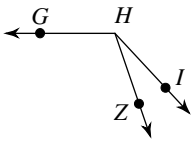
11) Find $m\angle HIW$ if $m\angle WIJ = 10x$, $m\angle HIJ = 145°$, and $m\angle HIW = 2x + 13$.



12 Ray BK bisects $\angle ABC$. $m\angle ABK = 4x + 36$, and $m\angle KBC = 12x - 4$. Solve for x and $m\angle ABC$.



13) $m\angle ZHG = 11x - 1$, $m\angle IHZ = 24°$, and $m\angle IHG = 12x + 13$. Find $m\angle IHG$.



14) $m\angle GFN = 4x + 10$, $m\angle NFE = 14x + 3$, and $m\angle GFE = 157°$. Find $m\angle NFE$.