

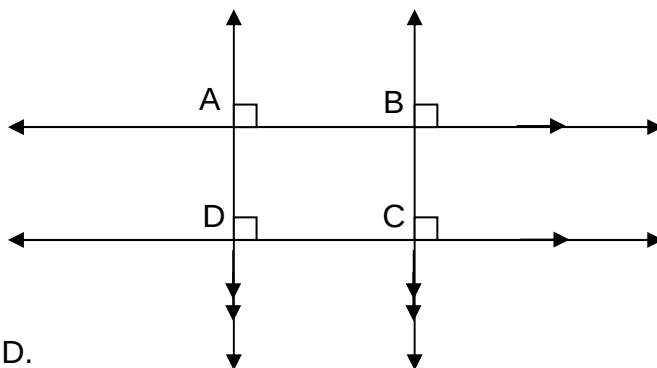
Distance and Length (pp. 1 of 4)

Definitions

- parallel lines –
- perpendicular lines –
- line segment –
- ray –
- AB or mAB – measure of $\overline{AB}$. For measures there is not a line above the AB .
- _____ on a number line are labeled with capital letters. _____ are the numbers that correspond to the points.

Examples

1. Name two sets of parallel lines.
2. Name two sets of perpendicular lines.
3. Name four line segments using A, B, C, and D.
4. Name four rays using A, B, C, and D.



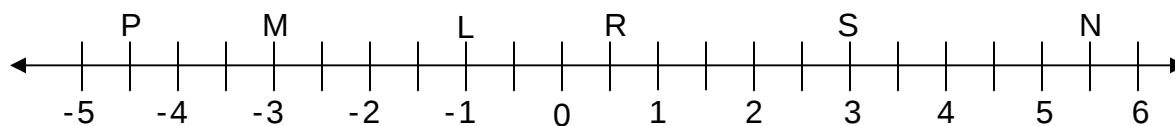
Distance and Length (pp. 2 of 4)

Ruler Postulate

Points on a line can be paired with real numbers and distance between the two points can be found by finding the absolute value of the difference between the numbers. Remember all distance measures must be _____.

Examples

Given the number line below, find the indicated distances.



5. PM

6. LN

7. RM

8. PS

9. NP

10. RN

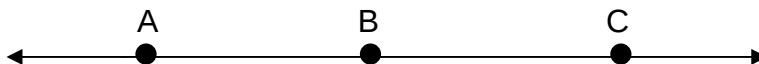
The Ruler Postulate can also be used to find the coordinate of a segment's endpoint given the other endpoint and the segment's length.

Example:

11. Suppose $\overline{AB}$ has a length of 12 and B has coordinate 5. Find the coordinate for point A both graphically and symbolically.

Distance and Length (pp. 3 of 4)

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 # 1-4.

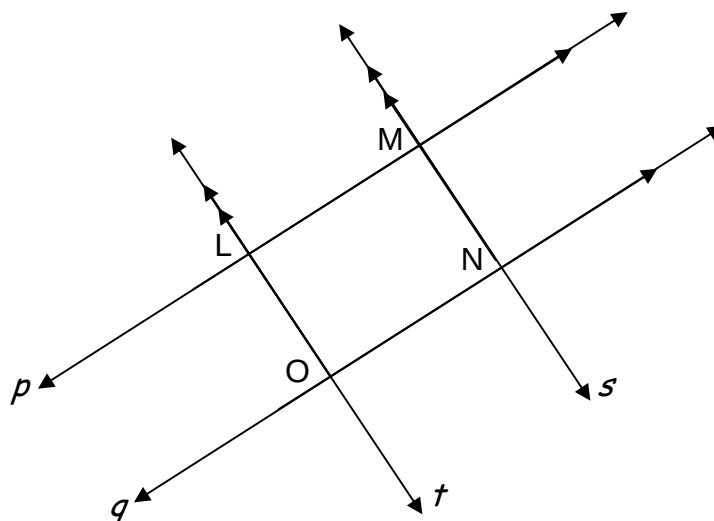
1. If $AB = 3$ units and $BC = 7$ units, what is AC ?
2. If $AC = 45$ units and $BC = 28$ units, what is AB ?
3. If $AB = 3x + 5$, $BC = 2x + 8$, and $AC = 88$, what is the value of x ?
4. If B was the midpoint of $\overline{AC}$ and $AC = 16$, what is the value of x when $AB = 2x + 4$?

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

Distance and Length (pp. 4 of 4)

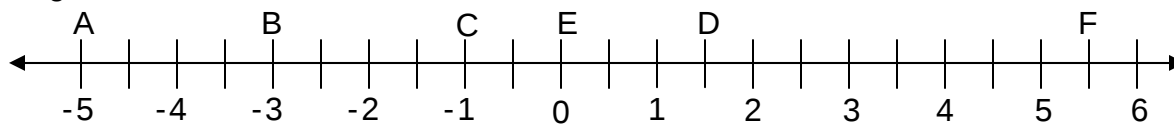
Practice Problems



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

1. Name two sets of parallel lines.
2. Name two sets of perpendicular lines.
3. Name two line segments using L, M, N, and O.
4. Name two rays using L, M, N, and O.
5. 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.



- | | | |
|-------|--------|--------|
| 6. AE | 7. DB | 8. FA |
| 9. AC | 10. ED | 11. FB |

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

12. If $KL = 27$ units and $KM = 84$ units, what is LM ?
13. If $KL = 2x$, $LM = 3x - 2$, and $KM = 43$, what is the value of x ?
14. If $KL = 4x - 1$, $LM = 2x - 1$, and $KM = 2x$, what is the value of x ?
15. If L is the midpoint of $\overline{KM}$ and $KM = 5x - 6$ and $LM = 2x + 4$, what is the value of x ?