Geometry 1.3

*8th standard

Find the distance between 2 points

Find the midpoint of a segment

coordinates*

pythagorean theorem* $a^2 + b^2 = c^2$

distance

irrational number $\sqrt{25} = 5$

midpoint avg x, avg y $\sqrt{50} \approx 7.1$

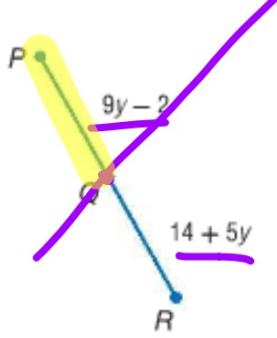
segment bisector

Quiz 1.1-1.2

There will be (at least) one construction

Example 6 Use Algebra to Find Measures

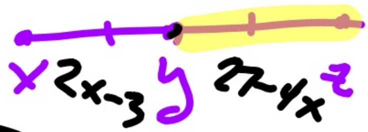
ALGEBRA Find the measure of $\overline{PQ}$ if Q is the midpoint of $\overline{PR}$.



$$9y - 2 = 14 + 5y$$
$$-5y \quad +2 \quad +2 \quad -5y$$
$$4y = 16$$
$$\frac{4y}{4} = \frac{16}{4}$$
$y = 4$ PQ = 34

One picture is worth 1000 words...

$27-20$



GuidedPractice

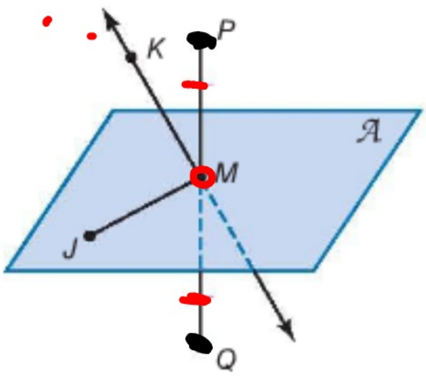
6A. Find the measure of $\overline{YZ}$ if Y is the midpoint of $\overline{XZ}$ and $XY = 2x - 3$ and $YZ = 27 - 4x$.

6B. Find the value of x if C is the midpoint of $\overline{AB}$, $AC = 4x + 5$, and $AB = 78$.

$$2x-3=27-4x$$
$$+4x+3 \quad +3+4x$$

$$\frac{6x}{6}=\frac{30}{6} \qquad x=5 \qquad YZ=7$$

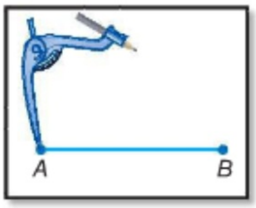
Any segment, line, or plane that intersects a segment at its midpoint is called a **segment bisector**. In the figure at the right, M is the midpoint of $\overline{PQ}$. Plane $\mathcal{A}$, $\overline{MJ}$, $\overleftrightarrow{KM}$, and point M are all bisectors of $\overline{PQ}$. We say that they *bisect* $\overline{PQ}$.



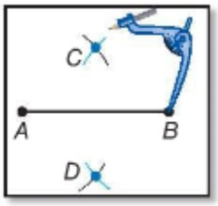
p.30 ← ÷ 2 equal parts

Construction Bisect a Segment

Step 1 Draw a segment and name it $\overline{AB}$. Place the compass at point A. Adjust the compass so that its width is greater than $\frac{1}{2}AB$. Draw arcs above and below $\overline{AB}$.



Step 2 Using the same compass setting, place the compass at point B and draw arcs above and below $\overline{AB}$ so that they intersect the two arcs previously drawn. Label the points of the intersection of the arcs as C and D.



Step 3 Use a straightedge to draw $\overline{CD}$. Label the point where it intersects $\overline{AB}$ as M. Point M is the midpoint of $\overline{AB}$, and $\overline{CD}$ is a bisector of $\overline{AB}$.