

3A: Angles & Segments

Angle Addition Postulate:

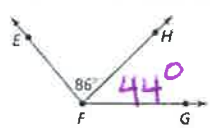
two smaller angles
make up larger \angle s

Segment Addition Postulate:

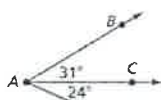
two smaller segments
make up larger segments

Easy:

$m\angle EFG = 130^\circ$. Find $m\angle HFG$.

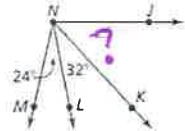


Find $m\angle BAD$.



$31 + 24 = 55^\circ$

$m\angle JNM = 103^\circ$. Find $m\angle JNK$.



130
 -86
 44

Medium:

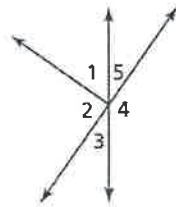
$m\angle 1 + m\angle 2 = m\angle 4$

$m\angle 5 = m\angle 3$

$m\angle 3 + m\angle 2 = 110^\circ$

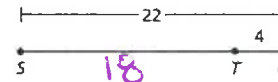
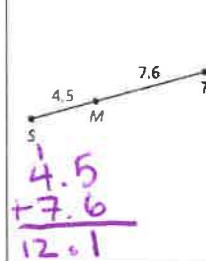
$m\angle 2 = 80^\circ$

Find the measure of all the other angles.

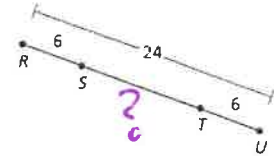


Easy:

Find the measure of segment ST:



$22 - 4 = 18$

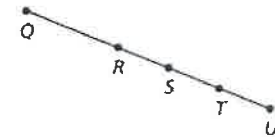


Medium:

In the diagram, $QU = 120$, $SU = 50$, and $RS = ST = TU$. Find the indicated values.

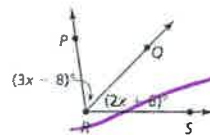
- a. RS
- c. RT
- e. RU

- b. QR
- d. QS
- f. QT

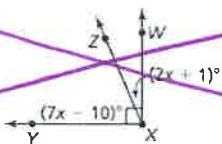


Difficult:

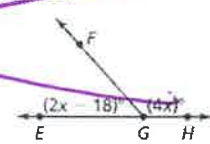
$m\angle PRS = 98^\circ$. Find $m\angle QRS$.



Find $m\angle WXZ$.



Find x .



Difficult:

In the following problem, point B is between A and C on segment AC. Use the given information to find an equation in terms of x . Then find the length of segment AC.

$AC = x + 32$

$AB = 13 + 2x$

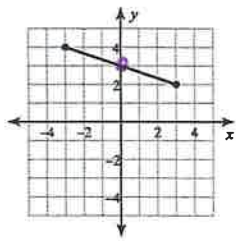
$BC = 12$

3A Continued

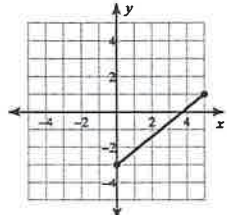
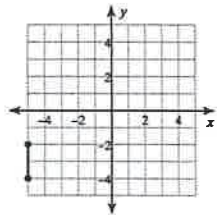
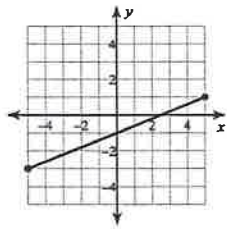
How to find a midpoint:

count or find the average

Find the midpoint of the following segments:



(0, 2)



Find the midpoint of the segment with the following endpoints:

$(-4, -5), (8, 9)$

$(-6, 7), (10, 1)$

$$\left(\frac{-4+8}{2}, \frac{-5+9}{2} \right) = (2, 2)$$

$(9, -2), (5, 0)$

$(4, 8), (-3, 8)$

Bonus:

Find the other endpoint of the line segment with the given endpoint and midpoint.

1) Endpoint: $(7, 2)$, midpoint: $(-7, 7)$

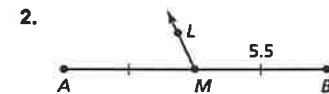
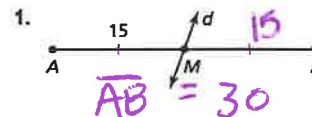
2) Endpoint: $(1, -5)$, midpoint: $(3, 6)$

3) Endpoint: $(-3, -9)$, midpoint: $(10, -4)$

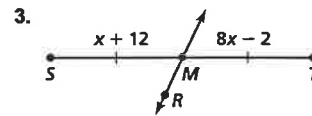
A segment or angle bisector...

cuts the segment/angle in half

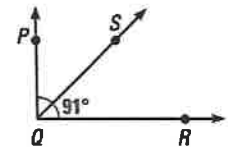
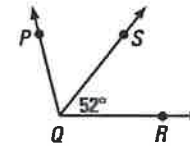
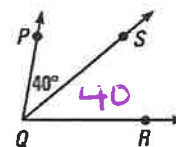
In Exercises 1 and 2, identify the segment bisector of \overline{AB} . Then find AB .



In Exercises 3 and 4, identify the segment bisector of \overline{ST} . Then find ST .



In problems 5 - 7, ray QS bisects the angle. Find the two missing angle measurements.



$$\angle PQR = 80^\circ$$

Challenge: Ray BX bisects angle ABC.

If $m\angle ABX = 5x$ and $m\angle XBC = 3x + 10$, find the $m\angle ABC$. (Solve for x first!)

