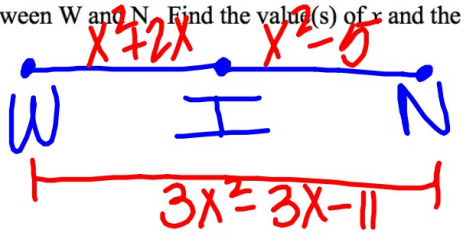
Segment Addition Postulate

1. I is between W and N. Find the value(s) of x and the length of IN if WI = $x^2 + 2x$, IN = $x^2 - 5$, and WN = $3x^2 - 3x - 11$.



$x^2+2x+x^2-5=3x^2-3x-11$

$2x^2+2x-5=3x^2-3x-11$

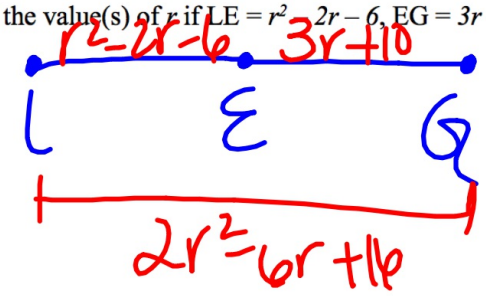
$0=x^2-5x-6$

$(x-6)(x+1)=0$

$x=6, -1$

2. S is the midpoint of segment TU. If TS = $2x - 11$ and TU = $x^2 - 4x - 31$, find SU.

3. Find the value(s) of r if LE = $r^2 - 2r - 6$, EG = $3r + 10$, LG = $2r^2 - 6r + 16$, and E is between segment LG.



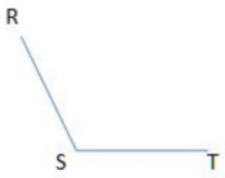
$r^2 + r + 4 = 2r^2 - 6r + 16$

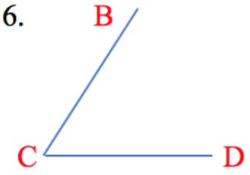
$0 = r^2 - 7r - 12$

$(r-4)(r-3) = 0$

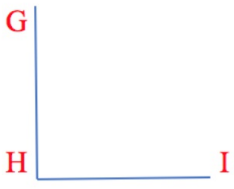
$r = 4, 3$

Answers to HW #5

1. $\angle XYZ, \angle ZYX, \angle Y$
2. $\angle MCP, \angle PCM, \angle C$ or $\angle 1$
3. $\angle ABC, \angle CBA$
4. $\angle CBD, \angle DBC$
5. 

6. 

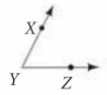
7. 

8. 

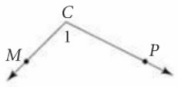
13. 34
14. 70

Name each angle in three ways.

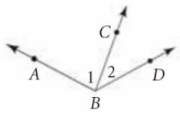
1.



2.



Use the figure at the right. Name the indicated angle in two different ways.



3. $\angle 1$ **4.** $\angle 2$

Draw and label a figure to fit each description.

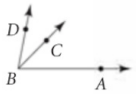
5. an obtuse angle, $\angle RST$

6. an acute acute, $\angle BCD$

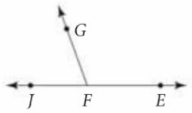
7. a straight angle, $\angle EFG$

8. a right angle, $\angle GHI$

13. Find $m\angle CBD$ if $m\angle ABC = 45$ and $m\angle ABD = 79$.



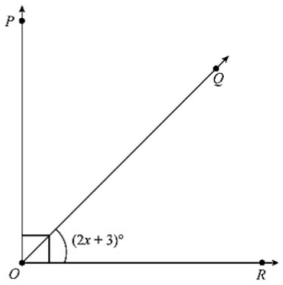
14. Find $m\angle GFJ$ if $m\angle EFG = 110$.



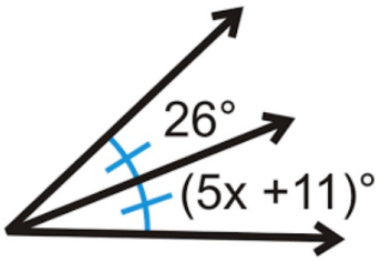
Objective 3: Using angle bisectors

Recall from earlier that bisect means to cut into 2 = parts. An angle can be bisected by a line, ray or segment. Let's draw an example below.

Example 5: Find $m\angle PQR$ in the figure below.



Example 6: Find the value of x.

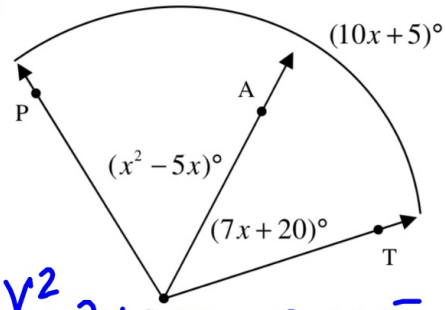


$5x+11=26 \Rightarrow 5x=15$

$x=3$

For questions 1-4, solve for x. Be sure to check for extraneous solutions.

1)



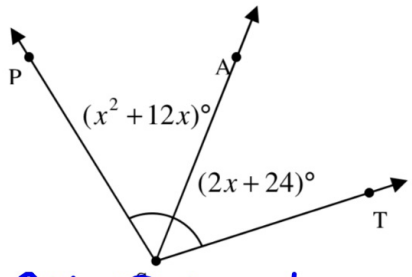
$x^2+2x+20=10x+5$

$x^2-8x+15=0$

$(x-3)(x-5)=0$

$x=3, 5$

2)



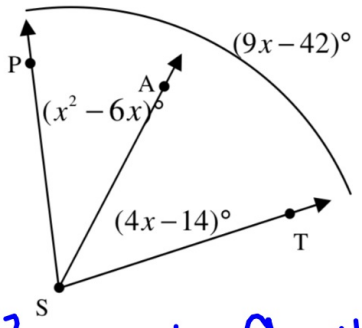
$x^2+12x=2x+24$

$x^2+10x-24=0$

$(x-12)(x+2)=0$

$x=12, -2$

3)



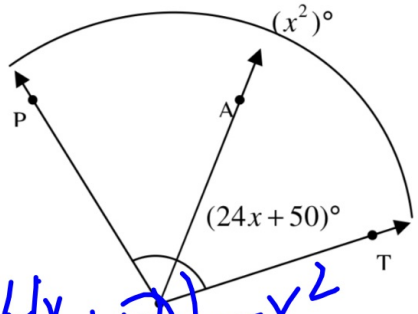
$x^2 - 2x - 14 = 9x - 42$

$x^2 - 11x + 28 = 0$

$(x-7)(x-4) = 0$

$x = 7, 4$

4)



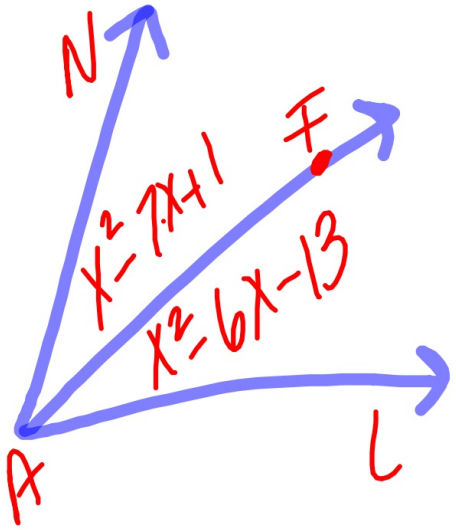
$2(24x + 50) = x^2$

$x^2 - 48x - 100 = 0$

$(x+2)(x-50) = 0$

$x = -2, 50$

5) F is in the interior of $\angle NAL$. If $m\angle NAF = x^2 - 7x + 1$, $m\angle FAL = x^2 - 6x - 13$, and $m\angle NAL = 3x^2 - 5x + 4$. Find the value of x and $m\angle NAL$.



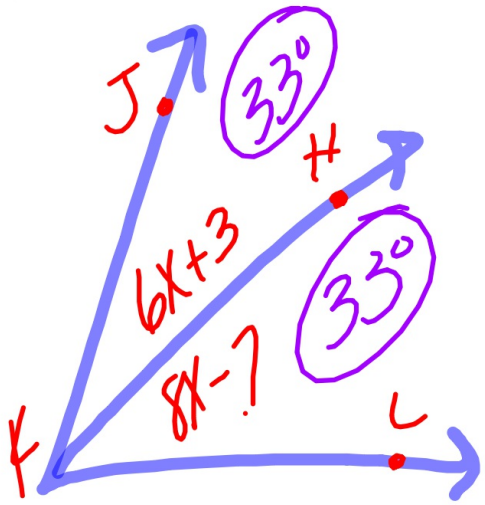
$x^2 - 7x + 1 + x^2 - 6x - 13 = 3x^2 - 5x + 4$

$x^2 + 8x + 16 = 0$

$(x+4)^2 = 0$

$x = -4$

6) $\overrightarrow{KH}$ bisects $\angle JKL$. If $m\angle JKH = 6x+3$ and $m\angle HKL = 8x-7$, find $m\angle JKL$.



$6X+3 = 8X-7$

$3 = 2X-7$

$10 = 2X$

$X = 5$