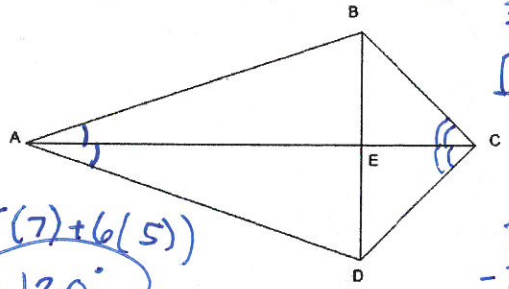
13. Hint: Set up a system of equations. If you do not remember how to solve a system of equations, refer to my video by searching "scevola 2.7". You could also skip to min 6:10 if you just want to see an example.

$\angle BAC = 3x+15$
$\angle BCA = 5y+6x$
$\angle DAC = 7y-1$
$\angle DCA = 9x+4$
$\overline{AC}$ bisects $\angle BAD$
$\overline{CA}$ bisects $\angle BCD$
Find $\angle BCD$

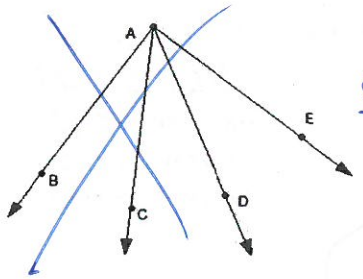


$3x+15 = 7y+1$
$3x-7y = -14$
$5y+6x = 9x+4$
$3x-5y = -4$

$3x-7y = -14$
$-3x+5y = 4$
$-2y = -10$
$y = 5$
$3x-7(5) = -14$
$3x = 21$
$x = 7$

$\hookrightarrow 2(5(7)+6(5))$
$= 130^\circ$

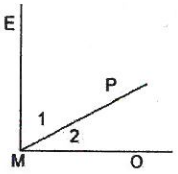
14. $\overline{AC}$ and $\overline{AD}$ trisect $\angle BAE$
$\angle BAD = 6x+12$
$\angle EAB = 9x+18$
Is $\angle BAE$ a right angle?

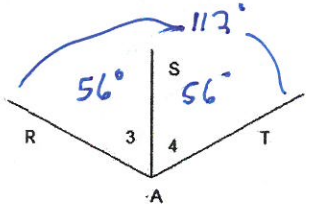


Skip

15. Is $\angle 2 \cong \angle 4$?
Justify your answer.

$\angle 1 = 3x+10 = 34^\circ$
$\angle 2 = 6x+8 = 56^\circ$
$\angle EMO$ is a right angle
$\overline{AS}$ bisects $\angle RAT$
$\angle RAT = 112^\circ$



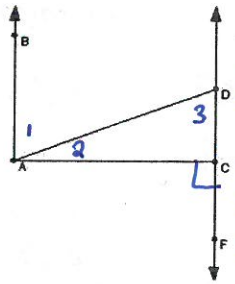


$3x+10+6x+8 = 90$
$9x+18 = 90$
$x = 8$

Yes

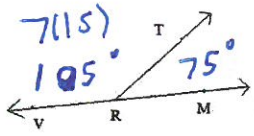
16. Given:
$\angle ACF$ is a right $\angle$
$\angle BAD = 70^\circ$
$\angle CAD = 20^\circ$

Prove: $\angle CDA \cong \angle BAD$
$\angle 1 \cong \angle 3$



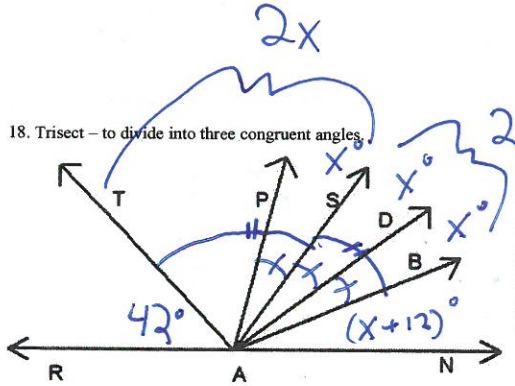
Statements	Reasons
$\angle ACF = 90^\circ$	Given
$\angle ACD = 90^\circ$	Linear Pair
$\angle 1 = 70$	Given
$\angle 2 = 20$	Given
$\angle 3 = 70$	Triangle Sum.
$\angle 1 = \angle 3$	Both 70°

17. The ratio of the measure of $\angle TRV$ to the measure of $\angle TRM$ is 7 to 5. Find $m\angle VRT$



$7x+5x = 180^\circ$
$\frac{12x}{12} = \frac{180}{12}$
$x = 15$

18. Trisect – to divide into three congruent angles.



$\overline{AD}$ & $\overline{AS}$ trisect $\angle BAP$
$\overline{AS}$ bisects $\angle BAT$
$m\angle NAB$ is 12° more than $m\angle DAB$
$m\angle TAR = 42^\circ$
Find $m\angle TAS$

$42+2x+2x+x+12 = 180$
$54+5x = 180$
$\frac{5x}{5} = \frac{136}{5}$
$x = \left(\frac{136}{5}\right)^\circ$
$\angle TAS = 2x = \frac{272^\circ}{5} \approx 54.4^\circ$