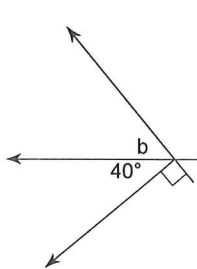


Angle Relationships: The Basics

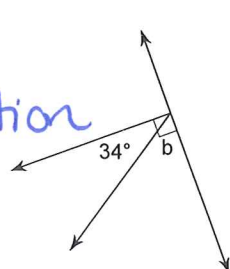
Directions: For all problems, you need to justify your set up. If Geometry is given, you will need to show the geometrical SET UP to the question.

Find the measure of angle b.

1) 

$$b + 40 = 90$$
 angle addition (90°)

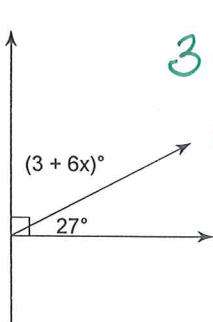
$$b = 50^\circ$$

2) 

$$b + 34 = 90$$
 angle add. (Right \angle)

$$b = 56^\circ$$

Find the value of x.

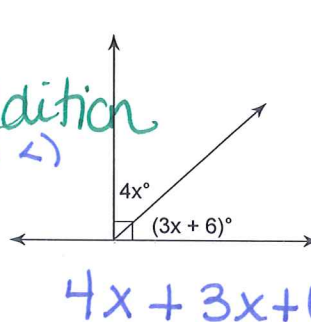
3) 

$$3 + 6x + 27 = 90$$
 angle addition (Right \angle)

$$6x + 30 = 90$$

$$6x = 60$$

$$x = 10$$

4) 

$$4x + 3x + 6 = 90$$
 angle addition (Right \angle)

$$7x + 6 = 90$$

$$7x = 84$$

$$x = 12$$

Find the measure of angle b.

5) 

$$b + 60 = 180$$
 linear pairs are suppl.

$$b = 120^\circ$$

6) 

$$81 + 6x + 3 = 180$$
 linear pairs are suppl.

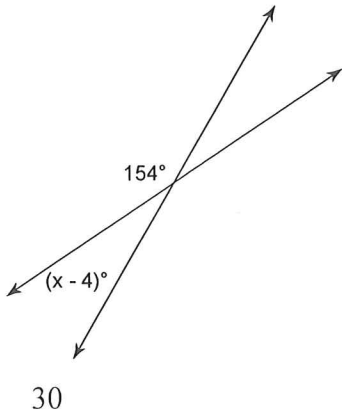
$$6x + 84 = 180$$

$$6x = 96$$

$$x = 16$$

Find the value of x.

7)



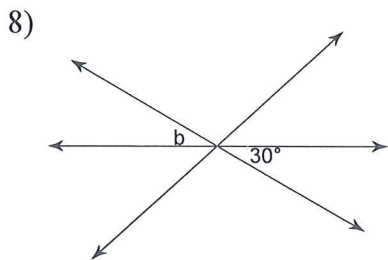
$$154 + x - 4 = 180$$

Linear Pairs are suppl.

$$x + 150 = 180$$

$$\boxed{x = 30}$$

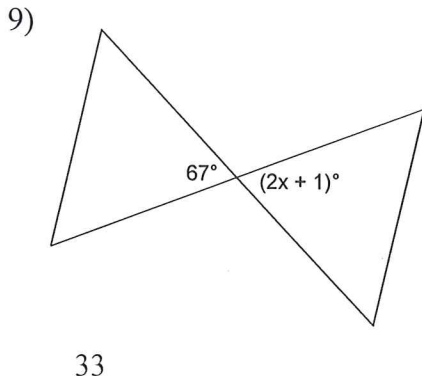
Find the measure of angle b.



$$\boxed{b = 30^\circ}$$

Vertical \angle s are \cong

Find the value of x.



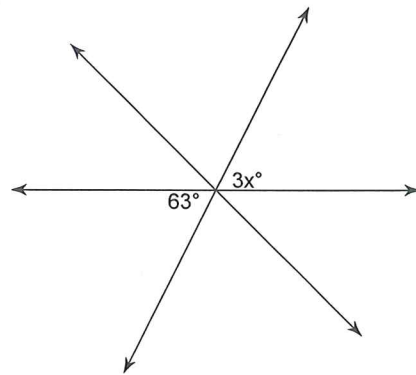
$$67 = 2x + 1$$

vertical \angle s are \cong

$$66 = 2x$$

$$\boxed{33 = x}$$

10) 21

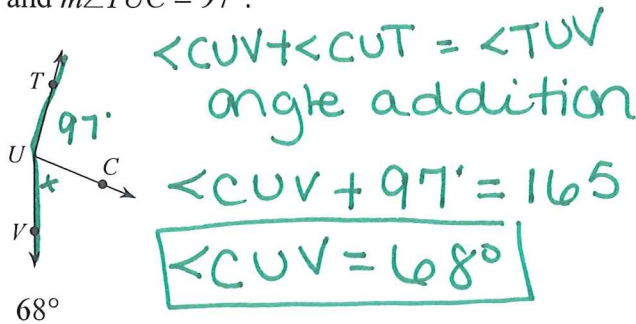


$$3x = 63$$

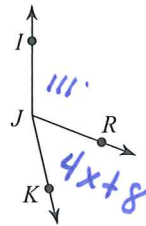
vertical \angle s are \cong

$$\boxed{x = 21}$$

- 11) Find $m\angle CUV$ if $m\angle TUV = 165^\circ$
and $m\angle TUC = 97^\circ$.



- 12) $m\angle RJK = 4x + 8$, $m\angle IJK = 14x - 1$,
and $m\angle IJR = 111^\circ$. Find x .



12

$\angle IJR + \angle RJK = \angle IJK$
angle addition

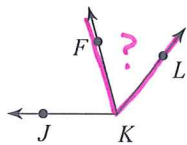
$$111 + 4x + 8 = 14x - 1$$

$$4x + 119 = 14x - 1$$

$$120 = 10x$$

$$\boxed{12 = x}$$

- 13) Find $m\angle FKL$ if $m\angle JKL = 129^\circ$,
 $m\angle JKF = x + 79$, and $m\angle FKL = 58 + x$.



54°

$\angle FKL + \angle FKF = \angle JKL$
angle addition

$$58 + x + x + 79 = 129$$

$$2x + 137 = 129$$

$$2x = -8$$

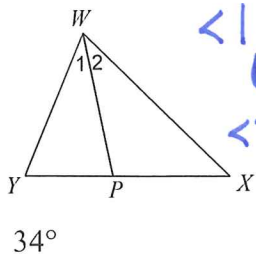
$$\boxed{x = -4}$$

$$\angle FKL = 58 + (-4)$$

$$\boxed{\angle FKL = 54^\circ}$$

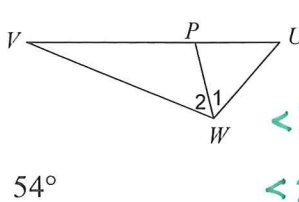
Each figure shows a triangle with one of its angle bisectors. Show Geometry and justify your SET UP!

14) Find $m\angle 2$ if $m\angle YWX = 68^\circ$.



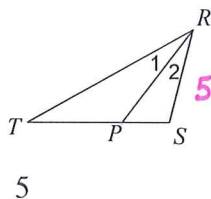
$\angle 1 \cong \angle 2$ def of \angle bisector
 $\angle 1 + \angle 2 = \angle YWX$ (angle addition)
 $\angle 2 + \angle 2 = \angle YWX$ (substitution)
 $2\angle 2 = \angle YWX$ (CLT)
 $2\angle 2 = 68^\circ$ substitution
 $\angle 2 = 34^\circ$ division

15) Find $m\angle 2$ if $m\angle UWV = 108^\circ$.



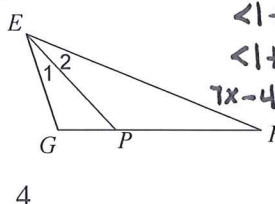
$\angle 1 \cong \angle 2$ def. of \angle bisector
 $\angle 1 + \angle 2 = \angle UWV$ angle addition
 $\angle 2 + \angle 2 = \angle UWV$ substitution
 $2\angle 2 = \angle UWV$ CLT
 $2\angle 2 = 108^\circ$ substitution
 $\angle 2 = 54^\circ$ division

16) $m\angle 1 = 5x - 2$ and $m\angle TRS = 8x + 6$. Find x .



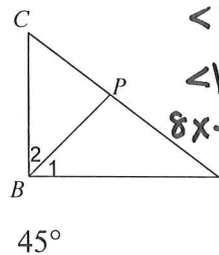
$\angle 1 \cong \angle 2$ def of \angle bisector
 $\angle 1 + \angle 2 = \angle TRS$ Angle addition
 $\angle 1 + \angle 1 = \angle TRS$ substitution
 $5x - 2 + 5x - 2 = 8x + 6$ Substitution
 $10x - 4 = 8x + 6$ CLT
 $2x - 4 = 6$ subtraction
 $2x = 10$ addition
 $x = 5$ division

17) Find x if $m\angle 1 = 7x - 4$ and $m\angle GEF = 11x + 4$.



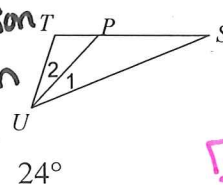
$\angle 1 \cong \angle 2$ def of \angle bisector
 $\angle 1 + \angle 2 = \angle GEF$ angle addition
 $\angle 1 + \angle 1 = \angle GEF$ substitution
 $7x - 4 + 7x - 4 = 11x + 4$ substitution
 $14x - 8 = 11x + 4$ CLT
 $3x - 8 = 4$ subtraction
 $3x = 12$ addition
 $x = 4$ division

18) $m\angle 1 = 8x - 3$ and $m\angle DBC = 14x + 6$. Find $m\angle 2$.



$\angle 1 \cong \angle 2$
 $\angle 1 + \angle 2 = \angle DBC$
 $\angle 1 + \angle 1 = \angle DBC$
 $8x - 3 + 8x - 3 = 14x + 6$
 $16x - 6 = 14x + 6$
 $2x - 6 = 6$
 $2x = 12$
 $x = 6$
 $\angle 2 = 8x - 3$
 $\angle 2 = 8(6) - 3$
 $\angle 2 = 45^\circ$ CLT

19) Find $m\angle 2$ if $m\angle 1 = x + 15$ and $m\angle 2 = 2x + 6$.



$\angle 1 \cong \angle 2$ def of \angle bisector
 $x + 15 = 2x + 6$ substitution
 $15 = x + 6$ subtraction
 $9 = x$ subtraction
 $\angle 2 = 2(9) + 6$ substitution
 $\angle 2 = 24^\circ$ CLT