

1. If an  $\angle$  measures  $68^\circ 28' 14''$ , what's the measure of its complement and its supplement?

$$\begin{array}{r} 89\ 59\ 60 \\ - 68\ 28\ 14 \\ \hline 21\ 31\ 46'' \end{array}$$

Compl.  $21^\circ 31' 46''$

$$\begin{array}{r} 179\ 59\ 60 \\ - 68\ 28\ 14 \\ \hline 111\ 31\ 46'' \end{array}$$

2. The measure of an angle is 4 times the measure of its complement. What's the supplement of the angle?

$x = \text{the } \angle$   
 $90 - x = \text{its comp.}$

$$\begin{aligned} x &= 4(90 - x) \\ x &= 360 - 4x \\ 5x &= 360 \\ x &= 72 \end{aligned}$$

so the suppl would be  
 $180 - 72 = 108^\circ$

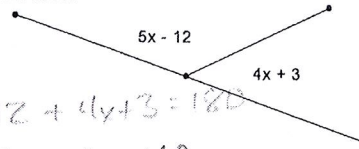
Fill in the blank:

3. If 2 angles are complementary, then they both have to be acute.

4. Angles that are ~~complementary~~ <sup>Supplementary</sup> and congruent are ~~Right~~ <sup>Right</sup> angles.

5. The supplement of an obtuse angle has to be acute.

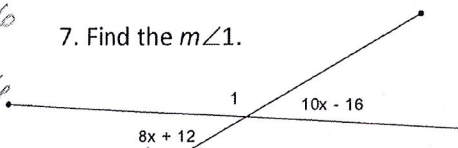
6. Find  $x$ .



$$\begin{aligned} 5x - 12 + 4x + 3 &= 180 \\ 9x - 9 &= 180 \\ 9x &= 189 \\ x &= 21 \end{aligned}$$

$$\begin{aligned} 8x + 12 &= 10x - 16 \\ -8x & \quad -8x \\ 12 &= 2x - 16 \\ +16 & \quad +16 \\ 28 &= 2x \\ 14 &= x \end{aligned}$$

7. Find the  $m\angle 1$ .



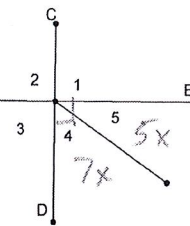
$$\begin{aligned} 8x + 12 &= 10x - 16 \\ 8(14) + 12 &= 124^\circ \end{aligned}$$

$$\angle 1 = 180 - 124 = 56^\circ$$

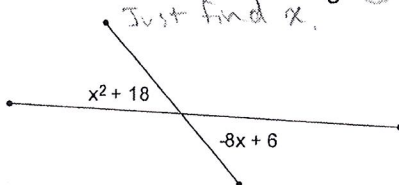
8.  $AB \perp CD$ . The measure of  $\angle 4$  and  $\angle 5$  are in the ratio 7:5. What are the measures of  $\angle 4$  &  $\angle 5$ ?

$$\begin{aligned} 7x + 5x &= 90 \\ 12x &= 90 \\ \frac{12x}{12} &= \frac{90}{12} \\ x &= 7.5 \end{aligned}$$

$$\begin{aligned} \angle 5 &= 5(7.5) = 37.5^\circ \\ \angle 4 &= 7(7.5) = 52.5^\circ \end{aligned}$$



9. Find the measure of all 4 angles in the diagram below:



Just find  $x$ .

$$\begin{aligned} x^2 + 18 &= -8x + 6 \\ x^2 + 8x + 12 &= 0 \end{aligned}$$

get zero on one side

$$(x + 6)(x + 2) = 0$$

$$x + 6 = 0 \quad x + 2 = 0$$

$$\boxed{x = -6 \quad x = -2}$$

Both values are valid

10.  $\angle R = 132^\circ$ .  $\angle R$  is bisected, then one of the resulting angles is trisected. What's the measure of one of the smallest angles?

$$132/2 = 66 \div 3 = \boxed{22^\circ}$$

11. If 2  $\angle$ s are supplementary to the same  $\angle$ , then they are Congruent to each other.

12. One of 2 supplementary angles is 4 more than twice the other. What is the measure of the angle?

$$X + 2x + 4 = 180$$

$$3x = 176$$

$$x \approx 58.7^\circ$$

What's the measure of the complement of the angle?   
 smaller & The  $\angle$  is  $\approx 121.3^\circ$    
 there is no complement!

13. The measure of the supplement of an angle plus the complement of the same angle is  $168^\circ$ . What's the measure of the original angle?

$$(180 - x) + (90 - x) = 168$$

$$270 - 2x = 168$$

$$-2x = -102$$

$$\boxed{x = 51}$$

14. Use the diagram at right. Find  $x$  &  $y$ .

Given:  $AB \perp BD$

$$\angle ACB = x + y$$

$$\angle BCD = 2x + 4$$

$$\angle ABC = x + 20$$

$$\angle CBD = y + 10$$

$\angle CBD$

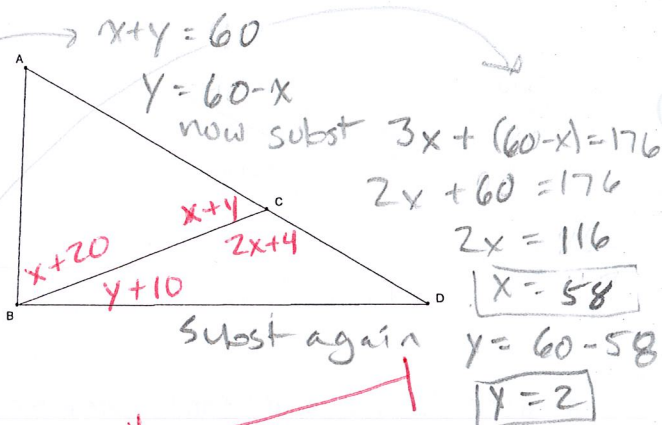
$$x + 20 + y + 10 = 90$$

$$\text{So } x + y = 60$$

$$x + y + 2x + 4 = 180$$

$$3x + y + 4 = 180$$

$$3x + y = 176$$

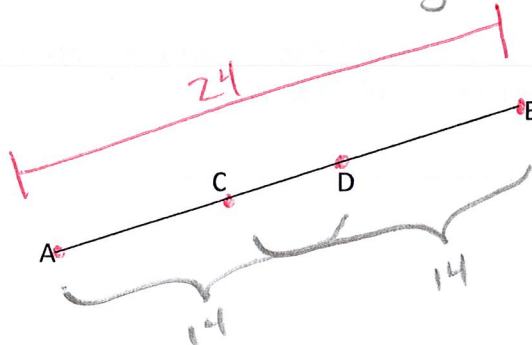


15.  $AB = 24$ ,  $AD = 14$ ,  $\overline{AD} \cong \overline{CB}$

$$CD = \underline{4}$$

$$AC = \underline{10} \quad 14 - 4$$

$$DB = \underline{10}$$



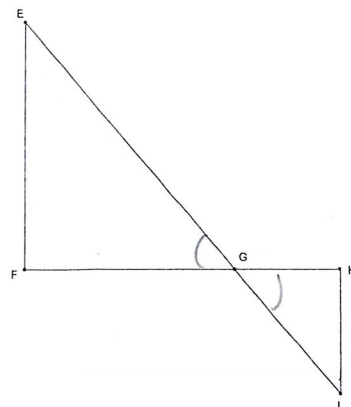
- 16.

$14 + 14 = 28$ . The 4 extra is CD.

19.

Given:  $\angle E \cong \angle EGF$ ,  $\angle I \cong \angle HGI$

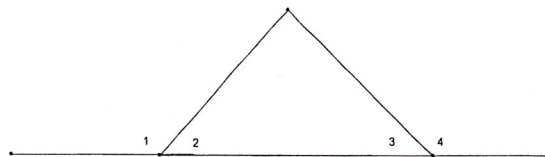
Prove:  $\angle E \cong \angle I$



Statement	Reason
1. $\angle E \cong \angle EGF$ , $\angle I \cong \angle HGI$	1. Given
2. $\angle EGF \cong \angle HGI$	2. Vertical Angles Thm
3. $\angle E \cong \angle I$	3. Substitution

20. Given:  $\angle 2 \cong \angle 3$

Prove:  $\angle 1 \cong \angle 4$



Statement	Reason
1. $\angle 2 \cong \angle 3$	1. Given
2. $\angle 1$ Suppl to $\angle 2$ $\angle 3$ Suppl to $\angle 4$	2. Linear Pairs
3. $\angle 1 \cong \angle 4$	3. Congruent Supplements Thm

21.