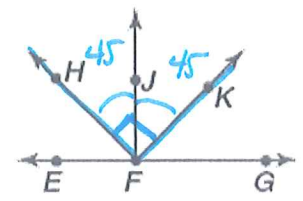


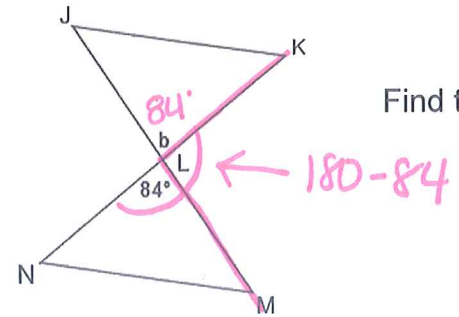
Angle Relationships TEST REVIEW Schmidt

1. Find the measure of each angle if the $m\angle HFK = 90^\circ$ and $m\angle HFG = 135^\circ$.
Ray FJ is an angle bisector of $\angle HFK$.

- a. $m\angle KFG =$ 45° b. $m\angle JFK =$ 45°
 c. $m\angle HFE =$ 45° d. $m\angle EFK =$ 135°

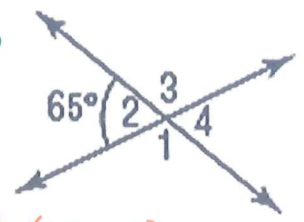


1e. Find the $m\angle KLM =$ 96°



2. Name each of the following in the figure at the right.

- a. two pairs of congruent angles $\angle 2 \cong \angle 4$ and $\angle 1 \cong \angle 3$
 b. a pair of acute vertical angles $\angle 2$ and $\angle 4$
 c. a pair of obtuse vertical angles $\angle 1$ and $\angle 3$
 d. four pairs of adjacent angles $(\angle 1, \angle 2), (\angle 1, \angle 4), (\angle 3, \angle 4), (\angle 2, \angle 3)$
 e. two pairs of vertical angles same as part a
 f. four linear pairs same as part d.
 g. four pairs of supplementary angles same as part d and f.



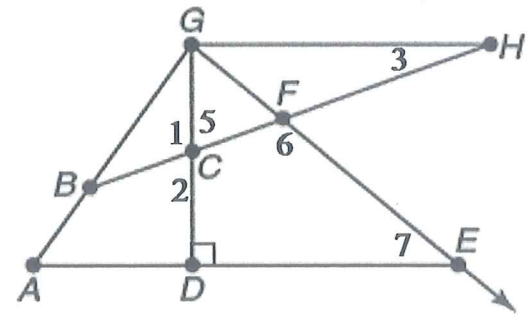
3. Classify all that apply, adjacent, vertical, linear pairs, ONE right angle, complementary, supplementary, and/or congruent.

a. $\angle 1$ and $\angle 5$
 linear pairs
 Suppl.
 adjacent

b. $\angle GFH$ and $\angle CFG$
 linear pairs
 Suppl.
 adjacent

c. $\angle 2$ and $\angle 5$
 Vertical \angle s
 Congruents

d. $\angle 2$ and $\angle FCD$
 linear pairs
 Suppl.



4. Two angles are complementary. The measure of one angle is 21 more than twice the measure of the other angle. Find the measures of the angles. (Show all work)

$$\underline{x} + \underline{2x + 21} = 90^\circ$$

23° and 67°

$$x = 23.$$

5. The measure of the supplement of an angle is 36 less than the measure of the angle. Find the measures of the angle. (Show all work).

$$\underline{x} + \underline{x - 36} = 180$$

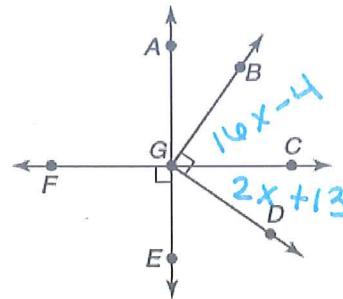
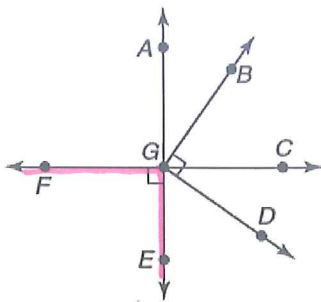
129°
and
51°

$$x = 129.$$

Directions: For questions #6-10, show all geometry, justify the set up, and show all work to receive full credit!

6 a. If $m\angle FGE = 5x + 10$, find x so that $\overrightarrow{FC} \perp \overrightarrow{AE}$.

6b. If $m\angle BGC = 16x - 4$ and $m\angle CGD = 2x + 13$, find x so that $\angle BGD$ is a right angle.



Geometry:

Justification:

Geometry:

Justification:

$$\begin{aligned} \angle FGE &= 90^\circ \\ 5x + 10 &= 90 \\ -10 \quad -10 \\ 5x &= 80 \\ x &= 16 \end{aligned}$$

def of \perp
(Not on
test to
justify)

$$\begin{aligned} \angle BGC + \angle CGD &= 90 \\ 16x - 4 + 2x + 13 &= 90 \\ 18x + 9 &= 90 \\ -9 \quad -9 \\ 18x &= 81 \\ \frac{18x}{18} &= \frac{81}{18} \end{aligned}$$

def of
Compl.

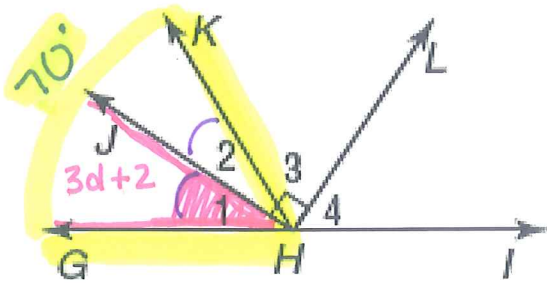
$$\boxed{x = 4.5}$$

$$x = \underline{16}$$

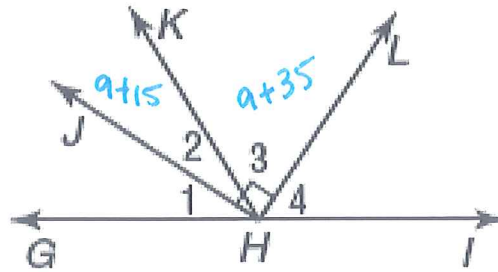
$$x = \underline{4.5}$$

7. \overline{HL} bisects $\angle KHI$.

a. If $\angle 1 \cong \angle 2$, $m\angle KHG = 70$, and $m\angle 1 = 3d + 2$, find d . (Lesson 1-4)



b. If $m\angle 2 = a + 15$ and $m\angle 3 = a + 35$, find a so that $\overline{HL} \perp \overline{HJ}$. (Lesson 1-5)



Geometry:

Justification:

$$\begin{aligned} \angle KHG &= 2\angle 1 && \text{def of} \\ 70^\circ &= 2(3d+2) && \angle \text{bisector} \\ 70 &= 2(3d+2) \\ 70 &= 6d+4 \\ -4 & \quad -4 \\ \underline{66} &= \underline{6d} \\ \underline{6} & \quad \underline{6} \end{aligned}$$

$d = \underline{11}$

Geometry:

Justification:

$$\begin{aligned} \angle 2 + \angle 3 &= 90^\circ && \text{def of} \\ a+15 + a+35 &= 90^\circ && \text{compl.} \end{aligned}$$

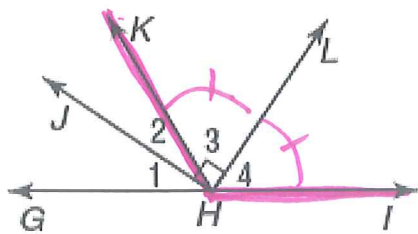
$$\begin{aligned} 2a + 50 &= 90 \\ -50 & \quad -50 \end{aligned}$$

$$\frac{2a}{2} = \frac{40}{2}$$

$$\boxed{a = 20}$$

$a = \underline{20^\circ}$

c. If \overline{HL} bisects $\angle KHI$, determine if the following statements could be true or false.



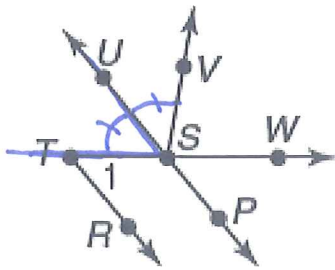
$\angle KHL \cong \angle LHI$ T

L is in the interior of $\angle KHI$ T

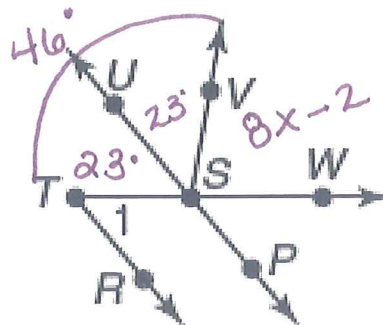
$m\angle KHL = 50^\circ$ and $m\angle KHI = 110^\circ$ F

$m\angle LHI = \frac{1}{2}(m\angle KHI)$ T

- 8a. Find $m\angle TSU$ if \overline{SU} bisects $\angle TSV$,
 $m\angle TSU = 4y + 11$, and $m\angle USV = 6y + 5$.



- 8b. Using information from 8a., find x , if
 $m\angle VSW = 8x - 2$.



Geometry:

$$\begin{aligned} \angle TSU &\cong \angle USV \\ 4y + 11 &= 6y + 5 \\ 11 &= 2y + 5 \\ 6 &= 2y \\ 3 &= y \end{aligned}$$

$y = \underline{3}$

$\angle TSU = \underline{23^\circ}$

Justification:

def of
 \angle bisector

$$\begin{aligned} \angle TSU &= 4(3) + 11 \\ \angle TSU &= 23^\circ \end{aligned}$$

Geometry:

$$\begin{aligned} \angle TSV + \angle VSW &= 180^\circ && \text{linear} \\ 46 + 8x - 2 &= 180^\circ && \text{Pairs} \\ 8x + 44 &= 180 && \text{are suppl.} \end{aligned}$$

$$\frac{8x}{8} = \frac{136}{8}$$

$x = 17$

$x = \underline{17}$

- 8c. Using the y and x from 8a and 8b above, find the value of $4x - 10y = \underline{38^\circ}$

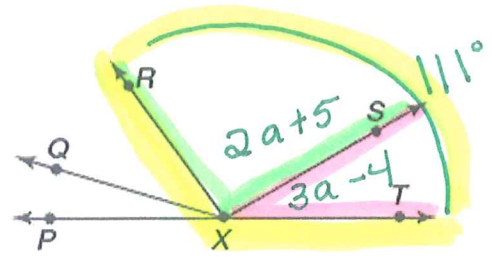
$$= 4(17) - 10(3)$$

$$= 68 - 30$$

$$= 38^\circ$$

9. In the figure to the right, \overline{XP} and \overline{XT} are opposite rays.

- a. If $\angle SXT = 3a - 4$, $\angle RXS = 2a + 5$, $\angle RXT = 111^\circ$.
Find a and the measure of $\angle RXS$.



Geometry:

Justification:

$$\angle SXT + \angle RXS = \angle RXT \quad \text{angle addition}$$

$$3a - 4 + 2a + 5 = 111$$

$$5a + 1 = 111$$

$$5a = 110$$

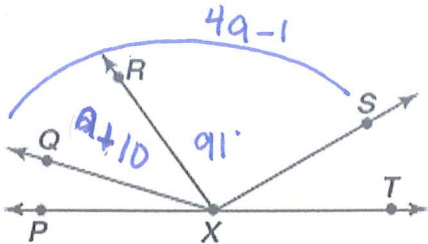
$$\boxed{a = 22}$$

$$a = \frac{22}{1}$$

$$\angle RXS = \frac{49^\circ}{1}$$

$$\angle RXS = 2(22) + 5 = 49^\circ$$

- b. If $\angle QXR = a + 10$, $\angle QXS = 4a - 1$, and $\angle RXS = 91^\circ$, Find a and $\angle QXS$.



Geometry:

Justification:

$$\angle QXR + \angle RXS = \angle QXS \quad \text{angle addition}$$

$$a + 10 + 91 = 4a - 1$$

$$101 = 3a - 1$$

$$102 = 3a$$

$$\boxed{34 = a}$$

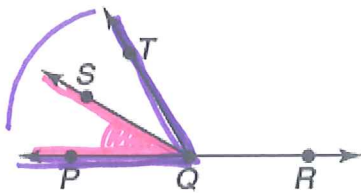
$$a = \frac{34}{1}$$

$$\angle QXS = \frac{135^\circ}{1}$$

$$\angle QXS = 4(34) - 1$$

10. \overline{QS} bisects $\angle PQT$, and \overline{QP} and \overline{QR} are opposite rays.

a) If $m\angle PQT = 60$ and $m\angle PQS = 4x + 14$, find the value of x .



Geometry:

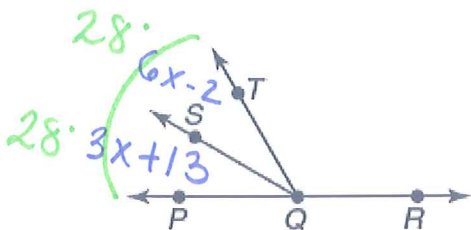
$$\begin{aligned} \angle PQT &= 2\angle PQS \\ 60 &= 2(4x + 14) \\ 60 &= 8x + 28 \\ \frac{32}{8} &= \frac{8x}{8} \\ \boxed{4} &= x \end{aligned}$$

Justification:

def of \angle
bisector

$$x = \underline{4}$$

b. If $m\angle PQS = 3x + 13$ and $m\angle SQT = 6x - 2$, find $m\angle PQT$.



Geometry:

$$\begin{aligned} \angle PQS &\cong \angle SQT \\ 3x + 13 &= 6x - 2 \\ 13 &= 3x - 2 \\ 15 &= 3x \\ \boxed{5} &= x \end{aligned}$$

Justification:

def of \angle
bisector

$$x = \underline{5}$$

$$\angle PQT = \underline{56^\circ}$$

11. Choose the correct word to complete each sentence.

a. If two parallel lines are cut by a transversal, then alternate exterior angles are

congruent (congruent/complementary/supplementary).

b. If two parallel lines are cut by a transversal, then corresponding angles are

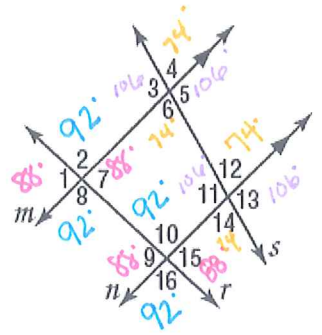
\cong (congruent/complementary/supplementary).

c. If parallel lines are cut by a transversal, then consecutive interior angles are

Supplementary (congruent/complementary/supplementary).

12. In the figure, $m\angle 2 = 92$ and $m\angle 12 = 74$. Find the measure of each angle.

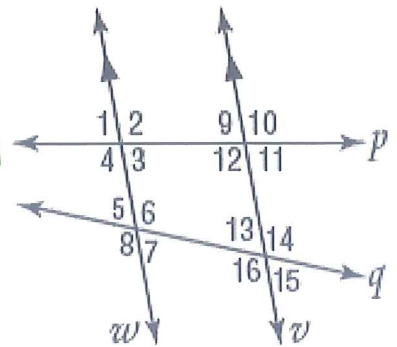
1. $\angle 10 = 92^\circ$
2. $\angle 8 = 92^\circ$
3. $\angle 9 = 88^\circ$
4. $\angle 5 = 106^\circ$
5. $\angle 11 = 106^\circ$
6. $\angle 13 = 106^\circ$



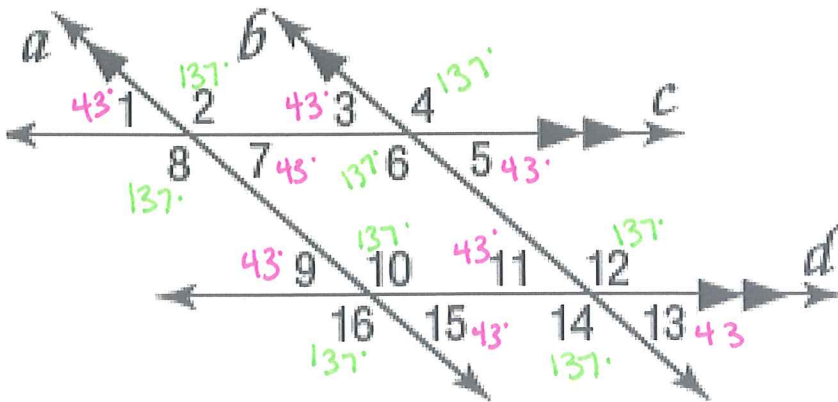
13. If $w \parallel v$, give the justification for each statement.

- a. $\angle 2 \cong \angle 12$
alt. int. \angle s are \cong
- b. $\angle 8 \cong \angle 14$
alt. Ext. \angle s are \cong
- d. $\angle 10 \cong \angle 2$
corresponding \angle s are \cong
- e. $\angle 7 + \angle 16 = 180^\circ$
con. int \angle s are suppl.

- c. $\angle 5 \cong \angle 13$
Corresponding angles are \cong
- f. $\angle 16 \cong \angle 6$
alt. int \angle s are \cong



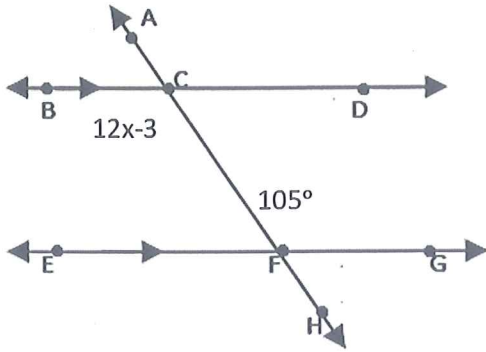
14. If $m\angle 3 = 43^\circ$, find the measures of each angle. Fill them in on the picture and list them out in order.



- $\angle 1 = 43^\circ$ $\angle 6 = 137^\circ$ $\angle 11 = 43^\circ$
- $\angle 2 = 137^\circ$ $\angle 7 = 43^\circ$ $\angle 12 = 137^\circ$
- $\angle 3 = 43^\circ$ $\angle 8 = 137^\circ$ $\angle 13 = 43^\circ$
- $\angle 4 = 137^\circ$ $\angle 9 = 43^\circ$ $\angle 14 = 137^\circ$
- $\angle 5 = 43^\circ$ $\angle 10 = 137^\circ$ $\angle 15 = 43^\circ$
- $\angle 16 = 137^\circ$

Directions: Find the value of the variable, show your geometry and justification for each.

15.



Geometry:

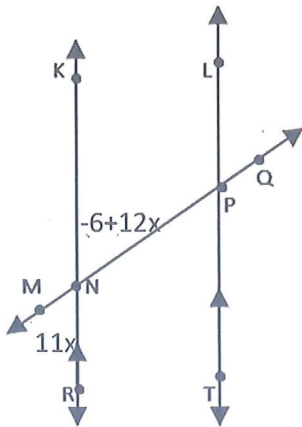
$$\begin{aligned} \angle BCF &\cong \angle CFG \\ 12x - 3 &= 105 \\ 12x &= 108 \\ x &= 9 \end{aligned}$$

Justification:

alt. int \angle s
are \cong
9

x = _____

16.



Geometry:

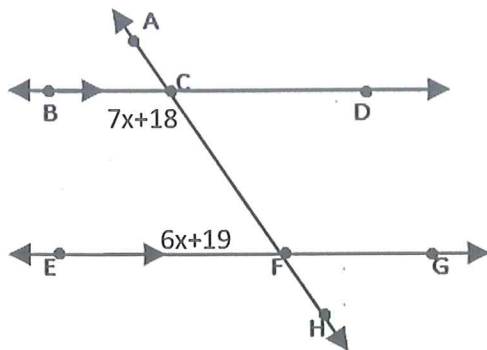
$$\begin{aligned} \angle KNP &\cong \angle MNR \\ -6 + 12x &= 11x \\ -6 &= -1x \\ \frac{-6}{-1} &= \frac{-1x}{-1} \\ \boxed{6} &= x \end{aligned}$$

Justification:

vertical
 \angle s are \cong

x = _____

17.



Geometry:

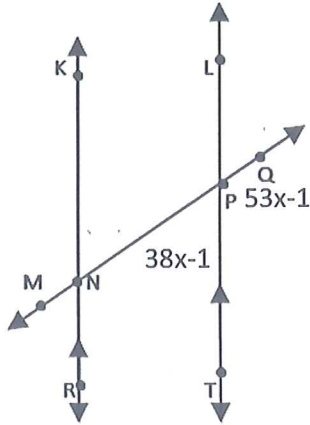
$$\begin{aligned} \angle BCF + \angle CFE &= 180^\circ \\ 7x + 18 + 6x + 19 &= 180^\circ \\ 13x + 37 &= 180 \\ 13x &= 143 \\ \boxed{x = 11} \end{aligned}$$

Justification:

con. int
 \angle s are
Suppl.

x = _____

18.



Geometry:

$$\begin{aligned} \angle QPT + \angle TPN &= 180 \\ 53x - 1 + 38x - 1 &= 180 \\ 91x - 2 &= 180 \\ 91x &= 182 \\ x &= 2 \end{aligned}$$

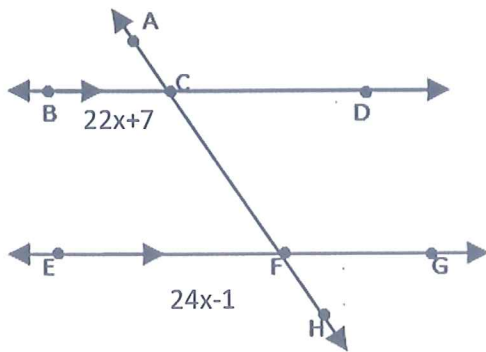
Justification:

linear Pairs are suppl.

x = 2

Directions: Find the value of the variable and the measure of the angle, show your geometry and justification for each.

19.



Geometry:

$$\begin{aligned} \angle BCF &\cong \angle EFH \\ 22x + 7 &= 24x - 1 \\ 7 &= 2x - 1 \\ \frac{8}{2} &= \frac{2x}{2} \end{aligned}$$

Justification:

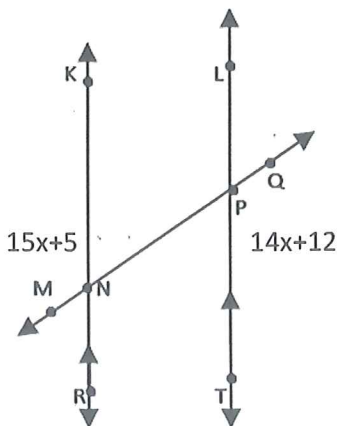
corr. \angle s are \cong

$$\begin{aligned} m\angle BCF &= 22(4) + 7 \\ \angle BCF &= 95 \end{aligned}$$

x = 4

m \angle BCF = 95°

20.



Geometry:

$$\begin{aligned} \angle MNK &\cong \angle QPT \\ 15x + 5 &= 14x + 12 \\ x + 5 &= 12 \\ -5 &\quad -5 \\ x &= 7 \end{aligned}$$

Justification:

alt. Ext. \angle s are \cong

$$\begin{aligned} \angle TPQ &= 14(7) + 12 \\ &= 110 \end{aligned}$$

x = 7

m \angle TPQ = 110°

21. If $\angle 3$ is complementary to $\angle 2$ and $\angle 1$ is supplementary to $\angle 3$. Find x and y if $\angle 1 = 13x + 4$, $\angle 2 = 5y + 4$ and $\angle 3 = 6x - 14$

$$\begin{aligned} \angle 3 + \angle 2 &= 90 && \rightarrow 6(10) - 14 + 5y + 4 = 90 \\ \angle 1 + \angle 3 &= 180 && \boxed{x=10} \end{aligned}$$

$$\begin{aligned} 13x + 4 + 6x - 14 &= 180 && 5y + 50 = 90 \\ 19x - 10 &= 180 && 5y = 40 \\ 19x &= 190 && \boxed{y=8} \end{aligned}$$

$$\begin{aligned} x &= \underline{10} \\ y &= \underline{8} \end{aligned}$$

22. Set up an equation that models the given situation.

a. The measure of one angle is 7 times the measure of its complement. Find the measure of each angle.

$$\begin{aligned} x + 7x &= 90 \text{ def of comp.} \\ 8x &= 90 \end{aligned}$$

11.25° and 78.75°

b. The measure of one angle is 15 times the measure of its supplement. Find the measure of each angle.

$$\begin{aligned} x + 15x &= 180 \\ 16x &= 180 \\ x &= 11.25 \end{aligned}$$

11.25° and 168.75°

c. The measure of one angle is 47 less than the measure of its supplement. Find the measure of each angle.

$$\begin{aligned} x + x - 47 &= 180 \\ 2x - 47 &= 180 \\ 2x &= 227 \end{aligned}$$

113.5° and 66.5°

d. Find the measure of two complementary angles if the difference in the measures of the two angles is 12. one angle is 12 more than the other.

$$\begin{aligned} x + x + 12 &= 90 \\ 2x + 12 &= 90 \\ 2x &= 78 \\ \boxed{x=39} \end{aligned}$$

39° and 51°