

Name: _____

Key

Angle Relationships Practice #4 Day 2

Directions: Use the diagram above to find the following. For each question you must show your geometry and justify your set up. Remember each question is independent and does not carry onto the next question. This diagram is not drawn to scale.

1. If $\angle NEC$ is a right angle, $\angle NEO = 5x + 1$ and $\angle OEC = 3x + 9$, find x .

Geometry

Justification

$\angle NEC = 90^\circ$ \rightarrow def of right \angle

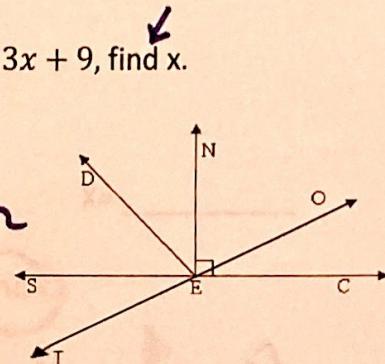
$\angle NEC = \angle NEO + \angle OEC \rightarrow$ angle addition

$$90 = 5x + 1 + 3x + 9$$

$$90 = 8x + 10$$

$$80 = 8x$$

$$\boxed{10 = x}$$



2. If $\angle DEC = 3x - 65$ and $\angle SED = x - 19$, find x .

Geometry

Justification

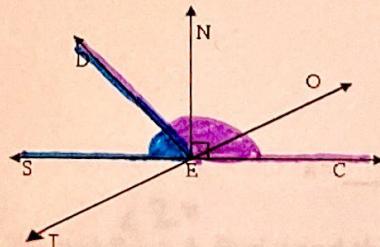
$\angle DEC + \angle SED = 180^\circ$ linear pairs

$3x - 65 + x - 19 = 180$ are Suppl.

$$4x - 84 = 180$$

$$4x = 264$$

$$\boxed{x = 66}$$



$$x = \underline{\hspace{2cm}}$$

3. If $\angle SET = 3x + 2$ and $\angle OEC = 83^\circ$ find x.

Geometry

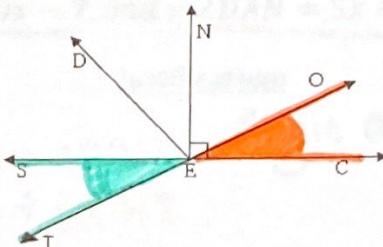
Justification

$$\angle SET \cong \angle OEC$$

$$3x + 2 = 83$$

$$3x = 81$$

$$\boxed{x = 27}$$



$$x = \underline{\hspace{2cm}}$$

4. If $\overrightarrow{EN} \perp \overrightarrow{SC}$, $\angle NEO = 4x + 7$ and $\angle OEC = 4x + 11$ find x.

Geometry

Justification

$$\angle NEC = 90^\circ \text{ def of } \perp$$

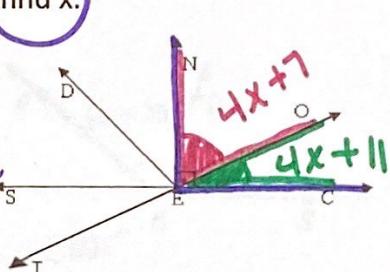
$$\angle NEC = \angle NEO + \angle OEC \text{ angle addition}$$

$$90 = 4x + 7 + 4x + 11$$

$$90 = 8x + 18$$

$$72 = 8x$$

$$\boxed{9 = x}$$



$$x = \underline{\hspace{2cm}}$$

5. If two angles are supplementary with measures $2x + 18$ and $5x + 1$, find x and the measure of both angles.

Geometry

Justification

$$\angle 1 + \angle 2 = 180^\circ$$

$$\text{def of } \underline{\hspace{2cm}} \text{ Suppl.}$$

$$m\angle 1 = 2(23) + 18$$

$$\boxed{m\angle 1 = 64^\circ}$$

$$2x + 18 + 5x + 1 = 180$$

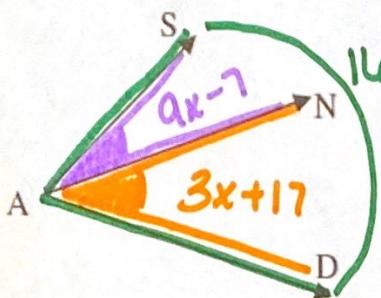
$$7x + 19 = 180$$

$$7x = 161$$
$$\boxed{x = 23}$$

$$m\angle 2 = 5(23) + 1$$

$$\boxed{m\angle 2 = 116^\circ}$$

6. Find x and the $m\angle SAD$ if $m\angle SAD = 16x - 2$, $m\angle SAN = 9x - 7$, and $m\angle DAN = 3x + 17$.



Geometry:

$$\angle SAD = \angle SAN + \angle DAN$$

$$16x - 2 = 9x - 7 + 3x + 17$$

Justification:

Angle addition

$$16x - 2 = 12x + 10$$

$$4x - 2 = 10$$

$$\begin{aligned} 4x &= 12 \\ x &= 3 \end{aligned}$$

$$m\angle SAD = 16(3) - 2$$

$$m\angle SAD = 46^\circ$$

7. In the diagram, \overrightarrow{RQ} bisects $\angle PRS$. The measures of the two congruent angles are $(x + 40)^\circ$ and $(3x - 20)^\circ$. Solve for x .

Geometry:

Justification:

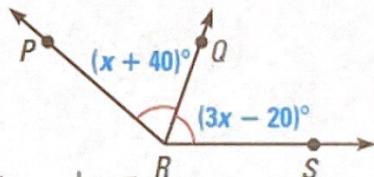
$\angle PRQ \cong \angle QRS$ def of angle bisector

$$x + 40 = 3x - 20$$

$$40 = 2x - 20$$

$$60 = 2x$$

$$30 = x$$



8. If two angles are complementary with measures $16x - 4$ and $2x + 13$, find x and the measure of both angles.

Geometry

$$\angle A + \angle B = 90^\circ$$

$$16x - 4 + 2x + 13 = 90$$

$$18x + 9 = 90$$

$$18x = 81$$

$$x = 4.5$$

Justification

def of compl.

- 9.) If $m\angle FGE = 5x + 10$ and $\overleftrightarrow{FC} \perp \overleftrightarrow{AE}$ at G , find x .

$$\angle FGE = 90^\circ \text{ def of } \perp$$

$$5x + 10 = 90$$

$$x = 16$$

