Solve each of the following problems. Make sure you complete each step as given in the bullet points!

1. \( \angle 1 \) and \( \angle 2 \) are complements of each other. \( m\angle 1 = (9x + 2) \) and \( m\angle 2 = (5x - 1) \). Find the value of the variable. Then find \( m\angle 1 \) and \( m\angle 2 \).
   - Highlight or circle the key word in the problem.
   - Write the definition of the word.
   - Write and solve an equation to find the value of the variable.

   \[
   x = \quad \quad \\
   m\angle 1 = \quad \quad \\
   m\angle 2 = \quad \quad 
   \]

2. \( \angle 3 \) and \( \angle 4 \) are a linear pair. \( m\angle 3 = (12x - 3) \) and \( m\angle 4 = (8x + 5) \). Find the value of the variable. Then find \( m\angle 3 \) and \( m\angle 4 \).
   - Highlight or circle the key word in the problem.
   - Write the theorem or postulate related to the word that will help you solve the problem.
   - Write and solve an equation to find the value of the variable.

   \[
   x = \quad \quad \\
   m\angle 3 = \quad \quad \\
   m\angle 4 = \quad \quad 
   \]

3. \( \overline{BT} \) bisects \( \angle ABC \). \( m\angle ABT = (8x + 1) \) and \( m\angle TBC = (3x + 12) \). Find the value of the variable. Then find the measures of \( \angle ABT, \angle TBC, \) and \( \angle ABC \).

   \[
   x = \quad \quad \\
   m\angle ABT = \quad \quad \\
   m\angle TBC = \quad \quad \\
   m\angle ABC = \quad \quad 
   \]

   - Label your diagram with the given information.
   - Circle the keyword.
   - Write the form of the equation that you should use based on that keyword.
   - Write and solve an equation to find the value of the variable.
4. S is between R and T. $RS = (6x+1), ST = (9x-2),$ and $RT = 56$. Find the value of the variable. Then find $RS$ and $ST$.

\[ x = \underline{\hspace{2cm}} \]
\[ RS = \underline{\hspace{2cm}} \]
\[ ST = \underline{\hspace{2cm}} \]

- Label your diagram with ALL of the given information.
- Write the form of the equation you would use to solve the problem.
- Write and solve an equation to find the value of the variable.

5. T is the midpoint of $SU$. $ST = (7x+2)$ and $TU = (2x+9)$. Find the value of the variable. Then find $ST$, $TU$, and $SU$.

\[ x = \underline{\hspace{2cm}} \]
\[ ST = \underline{\hspace{2cm}} \]
\[ TU = \underline{\hspace{2cm}} \]
\[ SU = \underline{\hspace{2cm}} \]

- Label your diagram with the given information.
- Circle the keyword.
- Write the form of the equation that you should use based on the keyword.
- Write and solve an equation to find the value of the variable.

6. Find the distance between the following sets of points. (i) Give your answer in simplified radical form. (ii) Then give your answer rounded to three decimal places.

A. $A(-12,1), B(2,9)$

B. $C(14,-2), D(-3,5)$
7. $M$ is the midpoint of $EF$. Given the coordinates of $M$ and $E$, find the coordinates of $F$, the other endpoint.

A. $E(15, -2), M(1, 3)$
B. $E(3, -7), M(-1, 4)$

8. The measure of an angle is 5 less than 4 times its supplement. Write and solve an equation to find the measures of the angles.

- How many angles are we trying to find?
- Represent each angle as an algebraic expression.
- Use your algebraic expressions to write and solve an equation.

9. The measure of an angle is 9 more than twice its complement. Write and solve an equation to find the measures of the angles.

- How many angles are we trying to find?
- Represent each angle as an algebraic expression.
- Use your algebraic expressions to write and solve an equation.

10. Two angles have a sum of $125^\circ$. The measure of one angle is 8 less than 3 times the other angle. Write and solve an equation to find the measures of the angles.

- How many angles are we trying to find?
- Represent each angle as an algebraic expression.
- Use your algebraic expressions to write and solve an equation.
11. Complete the following construction.

Given \( \angle OPW \) and \( \overline{YZ} \), use a straightedge and a compass to construct \( \angle ZYX \) with measure equal to \( 90 + \frac{1}{2} m \angle OPW \).

12. Find the perimeter and area of the following figure. Show all work! Round to the nearest thousandth.

Perimeter:

Area: