1. Draw an angle with the measure of $83^\circ$ and classify the angle.

2. The vertices of triangle $ABC$ are $A(0,-2)$, $B(5,-2)$, and $C(8,2)$. Use the distance formula to find the perimeter of triangle $ABC$.

3. $M$ is the midpoint of $AB$. The coordinates of $A$ are $(-2,3)$ and the coordinates of $B$ are $(4,-3)$. Find the coordinates of $M$.

4. If $M(0,2)$ is the midpoint of $AB$ and the coordinates of $A$ are $(3,6)$, then find the coordinates of $B$.

5. If $DM = 35$, what is the value of $r$?
6. If \(<1\) has a measure of \(38^\circ\), what is the measure of its complement?

7. Write the inverse of the following statement:
   “If you enter the Grand Prize drawing, then you will get rich.”

8. Write the converse of the following statement:
   “If you lower your cholesterol, then you eat Quirky oatmeal.”

9. Write the contrapositive of the following statement:
   “If you feed your dog Krazy Kibble, then it will grow three inches.”

10. Given each conditional, write the desired form:
    a) If 3 is a prime number, then it is odd. \(\text{INVERSE}\)

    b) If two segments are congruent, then they have the same length. \(\text{CONVERSE}\)

    c) If the weather is cloudy, then it will rain. \(\text{CONTRAPOSITIVE}\)

11. Two angles are complementary. The measure of one angle is \(15^\circ\) more than twice the other. What is the measure of the smaller angle?
    A. 35°  B. 65°  C. 55°  D. 25°
12. The measure of two supplementary angles are represented by $(3x+15)$ and $(2x-10)$. What is the value of $x$?

13. In the accompanying figure, two lines intersect, $m\angle 1 = 2x + 18$, and $m\angle 2 = 8x - 30$. Find the number of degrees in $m\angle 4$.

14. In the accompanying diagram, $\overline{AB}$ and $\overline{CD}$ intersect at $E$. If $m\angle AEC = 4x - 40$ and $m\angle BED = x + 50$, find the number of degrees in $\angle AEC$.

15. Find the measure of each letter.
16. Points $P$, $Q$, and $S$ are collinear.
   a. What is $m \angle PQR$?

   b. If a ray $QT$ bisects $\angle RQS$, what will be the measure of one of the resulting angles?

17. Points $L$, $M$, and $N$ are collinear and $M$ is between $L$ and $N$. You are given $LM = 13$ and $LN = 20$. What is a possible value of $MN$?

18. Ray $BD$ bisects $\angle ABC$ so that $m \angle DBC = (x + 6)$ and $m \angle ABD = (2x - 12)$. What is $x$?

19. Use the number line.
   a. What is $KN + IK$?

   b. What is the coordinate of the midpoint of $GO$?

20. Use inductive reasoning to find the next two terms in the sequence. Describe the pattern.
    a. $-4, 2, 8, 14, \ldots$
    b. $9, 5, 1, -3, \ldots$

21. Draw and label segment $AB$ with midpoint $C$.

Use your drawing from above: If $AC = 8x + 10$ and $CB = 10x - 6$ find the value of $x$, $AC$ and $AB$. 

4
22. \( \overline{MO} \) bisects \( \angle LMN \), \( m\angle LMO = 42 - x \) and \( m\angle LMN = 6x + 22 \). Solve for \( x \) and find \( m\angle LMN \). The diagram is not to scale.

23. Write a proof.

24. Complete the proof:

<table>
<thead>
<tr>
<th>Statements</th>
<th>Reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
<td>2. definition of congruent angles</td>
</tr>
<tr>
<td>3. &lt; 1 and &lt; 2 are a linear pair</td>
<td>3.</td>
</tr>
<tr>
<td>4.</td>
<td>4. Linear Pair Postulate</td>
</tr>
</tbody>
</table>
5. Substitution
6. \(<2\) is supplementary to \(<3\)

25. Find the value of the variable. Be sure to show your work.

26. Ray \(BD\) bisects \(\triangle ABC\) so that \(m\ \angle DBC = (5x - 9)^\circ\) and \(m\ \angle ABD = (2x + 27)^\circ\). What is \(x\)? (hint: create a picture)

27. Write a proof:
   Given: \(BX\) bisects \(<ABC\),
   prove: \(<1 \cong <3\)
28. Find a counterexample for the following statement? "All even numbers are multiples of 4."

29. Scott has decided to add push-ups to his daily exercise routines. He has created a chart that shows how many push-ups he has done in a day.
   a. How many push-ups will he have on day 6?
   b. Make a conjecture about how many push-ups he has at any given day.

30. Find $x$

   \[
   \begin{align*}
   m\angle 5 &= 5x, \\
   m\angle 6 &= 4x + 6, \\
   m\angle 7 &= 10x, \\
   m\angle 8 &= 12x - 12
   \end{align*}
   \]
Example: Write a two-column proof.

Given: ∠ABC and ∠CBD are complementary.
∠DBE and ∠CBD form a right angle.

Prove: ∠ABC ≅ ∠DBE

Complete each proof.

1. Given: ⊥;
   ∠1 and ∠3 are complementary.

   Prove: ∠2 ≅ ∠3

Proof:

<table>
<thead>
<tr>
<th>Statements</th>
<th>Reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. ⊥, ∠1 and ∠3 are complementary</td>
<td>a. _____________</td>
</tr>
<tr>
<td>b. ________________</td>
<td>b. Definition of ⊥</td>
</tr>
<tr>
<td>c. m∠ABC = 90</td>
<td>c. Def. of right angle</td>
</tr>
<tr>
<td>d. m∠ABC = m∠1 + m∠2</td>
<td>d. ____________</td>
</tr>
<tr>
<td>e. 90 = m∠1 + m∠2</td>
<td>e. Substitution</td>
</tr>
<tr>
<td>f. ∠1 and ∠2 are compliments</td>
<td>f. ____________</td>
</tr>
<tr>
<td>g. ∠2 ≅ ∠3</td>
<td>g. ____________</td>
</tr>
</tbody>
</table>
7. Complete the following proof.
   Given: bisects
   Prove: \( \angle 2 \equiv \angle 3 \)

Proof:

Given: \( \angle B \) is a right angle, 
\( \angle C \) is a right angle, 
\( \angle 1 \equiv \angle 4 \)

Prove: \( \angle 2 \equiv \angle 3 \)