

**For problems 1-2, determine the truth-value of each conjecture.
If the conjecture is false, provide a counterexample.**

1. **Given:** $\angle 1$ and $\angle 2$ are complementary.

Conjecture: $m\angle 1 = 40$ and $m\angle 2 = 50$.

2. **Given:** $\overline{GH}$ and $\overline{JK}$ intersect to form a right $\angle$.

Conjecture: $\overline{GH} \perp \overline{JK}$

For problem 3, write the given statement in conditional form.

3. Collinear points lie on the same line.

For problems 4 – 5, write the converse, inverse and contrapositive of each given conditional. Then state the truth-value of each statement.

4. If a ray bisects an angle , then the two $\cong \angle$'s are not formed.

Converse: _____

Inverse: _____

Contrapositive: _____

5. If M is the midpoint of $\overline{AB}$ then $\overline{AM} \cong \overline{MB}$

Converse: _____

Inverse: _____

Contrapositive: _____

For problems 6-8, use the Law of Detachment or the Law of Syllogism to determine if a valid conclusion can be made based on the two given statements. If so, write the conclusion, if not write no conclusion.

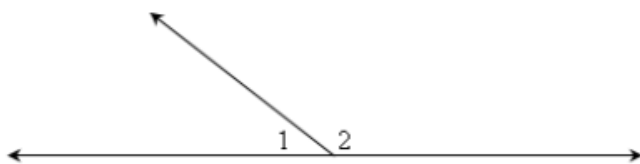
6. (1) If you attend a Saint Viator football game then you cheer loudly
(2) Megan attends a Saint Viator football game

7. (1) If two angles are right then they are $\cong$.
(2) If 2 $\angle$'s are right then their measures are 90° .

8. (1) If are late to school you then will receive a detention.
(2) If you receive a detention then your parents will ground you for the weekend.

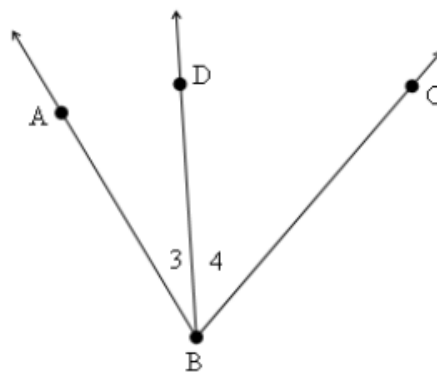
For problems 9-10, find the measure of each numbered angle.

9. In the following figure, $m\angle 8 = 4x + 14$ and $m\angle 9 = 7x - 10$.



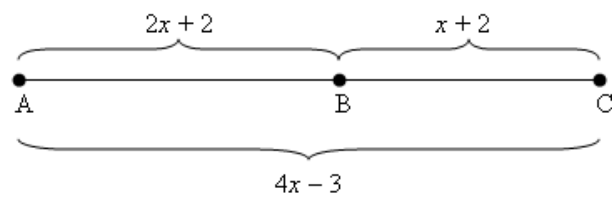
$m\angle 1 = \underline{\hspace{2cm}}$, $m\angle 2 = \underline{\hspace{2cm}}$

10. In the following figure, $m\angle 10 = 3x + 6$, $m\angle 11 = 5x - 3$, and $m\angle ABC = 10x - 15$.

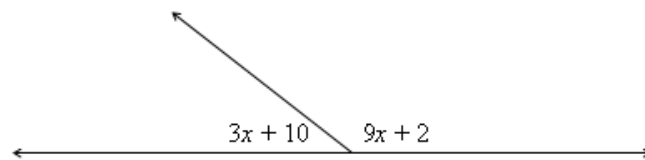


$m\angle 3 = \underline{\hspace{2cm}}$, $m\angle 4 = \underline{\hspace{2cm}}$

11. Find x .



12. Find x .



Write a 2-column proof.

13. **Given:** $6x + 2(x - 1) = 30$

Prove: $x = 4$

Write a 2-column proof.

14. **Given:** Pt. C is the midpt. of $\overline{AB}$
Pt. B is the midpt. of $\overline{CD}$

Prove: $\overline{AC} \cong \overline{BD}$



Write a 2-column proof.

15. **Given:** $\angle 1$ and $\angle 2$ are supplementary.
 $\angle 2$ and $\angle 3$ are supplementary.

Prove: $\angle 1 \cong \angle 3$

