**Geometry A** **Name**_____

**2.1A Inductive Reasoning and Conjecture** **ASSIGNMENT** **Hour ____ Date _____**

**1.** Suppose $\angle 1$ and $\angle 2$ form a linear pair. What conjecture(s) can you make from this information? (Choose all correct answers.)

A. $\angle 1$ and $\angle 2$ are supplementary.
B. $\angle 1$ and $\angle 2$ are complementary.
C. $\angle 1$ and $\angle 2$ are adjacent.
D. $\angle 1$ and $\angle 2$ are vertical angles.

**2.** Suppose $M$ is the midpoint of $AB$. What conjecture(s) can you make from this information? (Choose all correct answers).

A. $AM + AB = MB$
B. $AB = 2(AM)$
C. $AM = MB$
D. $AB = MB$

**3.** Given: $\angle A$ and $\angle B$ are supplementary.
Conjecture: $m\angle A = 90$ and $m\angle B = 90$.

Which one of the following is a counterexample to the conjecture?

A. $m\angle A = 30$ and $m\angle B = 60$
B. $m\angle A = 45$ and $m\angle B = 45$
C. $m\angle A = 80$ and $m\angle B = 100$
D. None of the above statements is a counterexample because the conjecture is true.

**For #4-7, show that each conjecture is false by finding a counterexample.**
**The counterexample can be displayed as a drawing or a statement.**

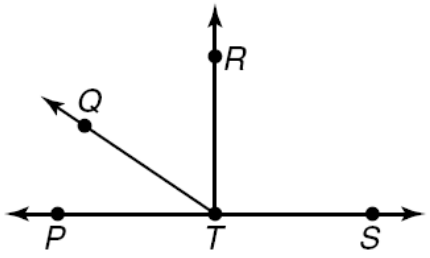
| | |
|---|---|
| **4.** Given: $\angle 1$ and $\angle 2$ form a linear pair.<br><br>Conjecture: $\angle 1 \cong \angle 2$<br><br>*Counterexample:* | **5.** Given: $\overline{AB}$, $\overline{BC}$, and $\overline{AC}$ are congruent.<br><br>Conjecture: $A$, $B$, and $C$ are collinear.<br><br>*Counterexample:* |
| **6.** Given: 3 lines $a$, $b$, and $c$ lie in the same plane.<br><br>Conjecture: The lines intersect at one point.<br><br>*Counterexample:* | **7.** Given: 2 acute angles<br><br>Conjecture: The sum of their measures equals the measure of an obtuse angle.<br>*Counterexample:* |

**Review:**

8. Find the value of $x$ and $ST$ if $S$ is between $R$ and $T$, $RS = 3x$, $ST = 5x - 7$ , and $RT = 81$.

9. Find the distance between A(-2, 3) and B(5, -4)

10. If $m\angle PTQ = 2x + 15$ and $m\angle QTR = 3x + 25$ find the value of $x$ so that $\overrightarrow{TR} \perp \overrightarrow{TS}$.



**Geometry A** **Name _____**

**2.1B Inductive Reasoning and Conjecture** **ASSIGNMENT Hour ____ Date _____**

**Complete each proof.**

**1.** **Given:** $4x + 8 = x + 2$
**Prove:** $x = -2$

| Statements | Reasons |
|---|---|
| 1. | 1. |
| 2. $4x + 8 = x + 2$<br>$-x \quad -x$ | 2. |
| 3. $3x + 8 = 2$ | 3. Substitution Property |
| 4. | 4. Subtraction Property |
| 5. | 5. Substitution Property |
| 6. $\frac{3x}{3} = \frac{-6}{3}$ | 6. |
| 7. | 7. Substitution Property |

**2.** **Given:** $\frac{x+5}{2} = 7$
**Prove:** $x = 9$

| Statements | Reasons |
|---|---|
| 1. $\frac{x+5}{2} = 7$ | 1. |
| 2. $(2)\frac{x+5}{2} = 7(2)$ | 2. |
| 3. $x + 5 = 14$ | 3. |
| 4. $x + 5 = 14$<br>$-5 \quad -5$ | 4. |
| 5. $x = 9$ | 5. |

**For #3-9, select the property that justifies each statement. Write the property on the line provided.**

| | | |
|---|---|---|
| reflexive property | subtraction property | division property |
| symmetric property | multiplication property | distributive property |
| transitive property | addition property | substitution property |

**3.** If $5x = 15$, then $5x + 3 = 15 + 3$ _____

**4.** $2(y - 5) = 2(y) - 2(5)$ _____

**5.** If $6n = 42$, then $\frac{6n}{6} = \frac{42}{6}$ _____

**6.** If $8c = 32$, then $32 = 8c$ _____

**7.** $17e = 17e$ _____

**8.** If $y = 5$ and $5 = 2n$, then $y = 2n$ _____

**9.** If $4m = 15$, then $2(4m) = 2(15)$ _____

**Review:**

10. Segment AB has endpoints A(-2, 3) and B(4, -7). Find the midpoint. In what quadrant does the midpoint lie?

11. $\angle 1$ and $\angle 2$ are vertical angles. If $m\angle 1 = (7x - 5)°$ and $m\angle 2 = (3x + 19)°$, find the value of $x$.

**Geometry A** **Name** _____

**2.2 Geometric Proof with Congruence** **ASSIGNMENT** **Hour** ____ **Date** _____

**For #1-12, write the name of the property, definition, or theorem that justifies each statement.**

**1.** If $AB = RS$ and $RS = WY$, then $AB = WY$. _____

**2.** If $AB = CD$, then $3AB = 3CD$. _____

**3.** If $m\angle 1 + m\angle 2 = 110^o$ and $m\angle 2 = m\angle 3$, then $m\angle 1 + m\angle 3 = 110^o$. _____

**4.** $RS = RS$ _____

**5.** If $AB = RS$, then $AB + 5 = RS + 5$. _____

**6.** If $m\angle 4 = m\angle 5$ and $m\angle 5 = m\angle 6$, then $m\angle 4 = m\angle 6$. _____

**7.** If $4x = 8$, then $4x - 2 = 8 - 2$. _____

**8.** If $80^o = m\angle A$, then $m\angle A = 80^o$. _____

**9.** If $\overline{DE} \cong \overline{GH}$ and $\overline{GH} \cong \overline{JK}$, then $\overline{DE} \cong \overline{JK}$. _____

**10.** If $E$ is the midpoint of $\overline{XY}$, then $\overline{XE} \cong \overline{EY}$. _____

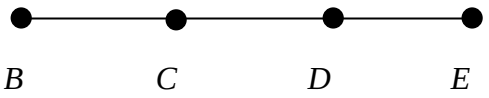
**11.** If $\overrightarrow{JL}$ bisects $\angle AJC$, then $\angle AJL \cong \angle CJL$. _____

**12.** If $m\angle 3 = m\angle 4$, then $\frac{m\angle 3}{10} = \frac{m\angle 4}{10}$. _____

**13.** **Complete the following proof.**

**Given:** $C$ is the midpoint of $\overline{BD}$.

$D$ is the midpoint of $\overline{CE}$.




**Prove:** $\overline{BC} \cong \overline{DE}$

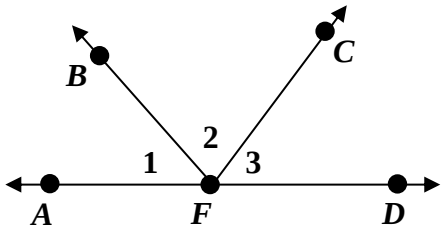
| Statements | Reasons |
|---|---|
| 1. $C$ is the midpoint of $\overline{BD}$. | 1. |
| 2. $D$ is the midpoint of $\overline{CE}$. | 2. |
| 3. $\overline{BC} \cong \overline{CD}$ | 3. |
| 4. $\overline{CD} \cong \overline{DE}$ | 4. |
| 5. $\overline{BC} \cong \overline{DE}$ | 5. |

**14. Complete the following proof.**

**Given:** $\overrightarrow{FB}$ bisects $\angle AFC$

$\overrightarrow{FC}$ bisects $\angle DFB$

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




| Statements | Reasons |
|---|---|
| 1. $\overrightarrow{FB}$ bisects $\angle AFC$ | 1. |
| 2. $\overrightarrow{FC}$ bisects $\angle DFB$ | 2. |
| 3. | 3. Definition of an angle bisector |
| 4. | 4. Definition of an angle bisector |
| 5. | 5. |

**Review:**

15. $\angle 1$ and $\angle 2$ form a linear pair. If $m\angle 1 = (7x - 5)°$ and $m\angle 2 = (2x + 20)°$, find the value of $x$.

16. The measure of the complement of an angle is 11 less than the measure of the angle. Find the measures of the angles.

**Geometry A** **Name _____**

**2.3 Geometric Proofs with Addition** **ASSIGNMENT** **Hour ____ Date _____**

**For #1-20, state the property, definition, theorem, or postulate that justifies each statement.**

**1.** $QA = QA$. _____

**2.** If $\overline{AB} \cong \overline{BC}$ and $\overline{BC} \cong \overline{CE}$, then $\overline{AB} \cong \overline{CE}$. _____

**3.** If $Q$ is between $P$ and $R$, then $PQ + QR = PR$. _____

**4.** If $EF + GH = 14$ and $GH = 8$, then $EF + 8 = 14$. _____

**5.** If $\overline{MN} \cong \overline{PQ}$, then $\overline{PQ} \cong \overline{MN}$. _____

**6.** If $m\angle 7 + m\angle 8 = 85^o$ and $m\angle 8 = 41^o$, then $m\angle 7 + 41^o = 85^o$. _____

**7.** If $R$ is the midpoint of $\overline{QT}$, then $\overline{QR} \cong \overline{RT}$. _____

**8.** If $m\angle 1 = m\angle 2$, then $m\angle 1 + 30 = m\angle 2 + 30$. _____

**9.** If $m\angle 1 = 23$ and $m\angle 2 = m\angle 1$, then $m\angle 2 = 23$. _____

**10.** If $B$ is between $C$ and $D$, then $CB + BD = CD$. _____

**11.** If $m\angle 1 + m\angle 2 = 110$ and $m\angle 2 = m\angle 3$, then $m\angle 1 + m\angle 3 = 110$._____

**12.** If $RS = ST$, then $RS + VW = ST + VW$ _____

**13.** If $\overrightarrow{JL}$ bisects $\angle AJC$, then $\angle AJL \cong \angle CJL$. _____

**14.** If $m\angle 4 = m\angle 5$ and $m\angle 5 = m\angle 6$, then $m\angle 4 = m\angle 6$. _____

**15.** If $100 = m\angle B$, then $m\angle B = 100$. _____

**16.** If $X$ is the midpoint of $\overline{BC}$, then $\overline{BX} \cong \overline{CX}$. _____

**17.** $7(x + 3) = 7x + 21$ _____

**18.** If two angles form a linear pair, then the sum of those two angles will be 180 degrees.

_____

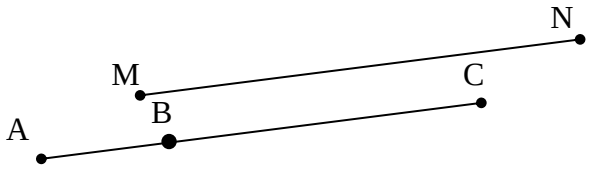
**19.** If $B$ is in the interior of $\angle ACD$, then $m\angle ACB + m\angle BCD = m\angle ACD$. _____

**20.** If two angles form a right angle, then the sum of their angles will be 90 degrees.

_____

**21.** **Given:** $AC = MN$

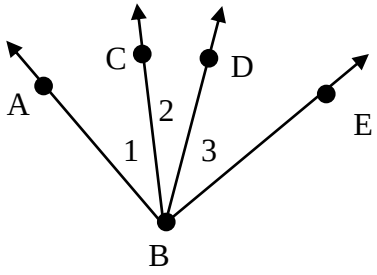
**Prove:** $AB + BC = MN$




| Statements | Reasons |
|---|---|
| $AC = MN$ | |
| $AC = AB + BC$ | |
| $MN = AB + BC$ | |
| $AB + BC = MN$ | |

**22.** Complete the proof below:

Given: $m\angle 1 = m\angle 3$
Prove: $m\angle ABD = m\angle CBE$




| Statements | Reasons |
|---|---|
| 1. $m\angle 1 = m\angle 3$ | 1. |
| 2. $m\angle 1 + m\angle 2 = m\angle ABD$ | 2. |
| 3. $m\angle 3 + m\angle 2 = m\angle ABD$ | 3. |
| 4. $m\angle 3 + m\angle 2 = m\angle CBE$ | 4. |
| 5. $m\angle ABD = m\angle CBE$ | 5. |

**Review:**

23. Find the perimeter of the square.