Given the following statements, state the reason that would follow in a proof.

1. M is the Midpoint of $\overline{AB}$
   $\overline{AM} \cong \overline{MB}$

   _____

2. $\angle 1$ and $\angle 2$ are a linear pair
   $\angle 1$ and $\angle 2$ are supplementary

   _____

3. $AB = BC, DE = EF$
   $AB + DE = BC + EF$

   _____

4. $\angle 1 \cong \angle 2$
   $\angle 2 \cong \angle 1$

   _____

5. $\angle 1 \& \angle 2$ are complementary
   $\angle 2 \& \angle 3$ are complementary
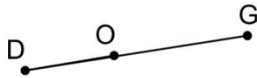 $\angle 1 \cong \angle 3$

   _____

6. $6(x + 4)$
   $6x + 24$

   _____

7. $\angle 3 \cong \angle 4$
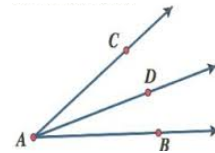 $m\angle 3 = m\angle 4$

   _____

8. $\angle 1 \& \angle 2$ are supplementary
   $m\angle 1 + m\angle 2 = 180$

   _____

9. $\angle Q$ and $\angle P$ are right angles
   $\angle Q \cong \angle P$

   _____

10. $DO + OG = DG$

   _____

11. $\overrightarrow{AD}$ bisects $\angle CAB$
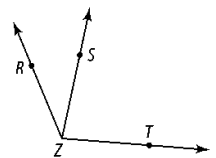 $\angle CAD \cong \angle DAB$

   _____

Use the given property to complete each statement.

12. **Vertical $\angle$'s are $\cong$ (Vert. $\angle$s Thm)**

    If $\angle 1$ and $\angle 2$ are vertical angles, then

    _____

13. **Angle Addition Postulate**

    $m\angle RZS + m\angle SZT = m\angle$_____

14. **Transitive Property of Congruence**

    If $\angle A \cong \angle B$, $\angle C \cong \angle B$, then

    _____

15. **Reflexive Property of Equality**

    $m\angle A =$ _____

16. **Substitution Property of Equality**
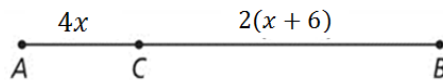
    If $AB + CD = EF$ and $CD = 12$, then

    _____

17. **Symmetric Property of Congruence**

    If $\overline{FG} \cong \overline{GH}$, then

    _____

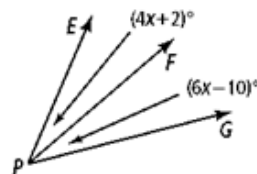**Complete each proof by giving the reason or statement for each statement**.

18. **Given**: $AB = 48$

    Prove: $x = 6$

$4x$ $2(x+6)$
A   C   B

Statements	Reasons
1. $AB = 48$	1.
2.	2. Segment Addition Postulate
3. $4x + 2(x+6) = 48$	3.
4. $4x + 2x + 12 = 48$	4.
5. $6x + 12 = 48$	5.
6. $6x = 36$	6.
7. $x = 6$	7.

19. **Given**: $\overrightarrow{PF}$ bisects $\angle EPG$

    Prove: $x = 6$

E $(4x+2)°$
F
$(6x-10)°$
G
P

Statements	Reasons
1. $\overrightarrow{PF}$ bisects $\angle EPG$	1.
2. $\angle EPF \cong \angle FPG$	2.
3. $m\angle EPF = m\angle FPG$	3.
4. $4x + 2 = 6x - 10$	4.
5. $-2x = -12$	5.
6. $x = 6$	6.

20. **Given**: $m\angle GFI = 128°$

    Prove: $x = 10$

G $(9x-2)°$ E
F $4x°$ I
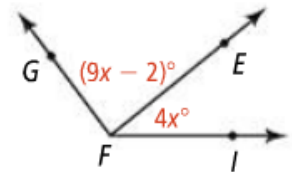
Statements	Reasons
1. $m\angle GFI = 128°$	1.
2.	2. Angle Addition Postulate
3. $9x - 2 + 4x = 128$	3.
4.	4. Combine like terms
5.	5. Addition POE
6. $x = 10$	6.

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

         $\angle 3$ and $\angle 4$ are complementary

         $\angle 2 \cong \angle 3$

    Prove: $\angle 1 \cong \angle 4$

1   4
2 3

Statements	Reasons
1. $\angle 1$ and $\angle 2$ are complementary	1.
$\angle 3$ and $\angle 4$ are complementary	
$\angle 2 \cong \angle 3$	
2. $m\angle 2 = m\angle 3$	2.
3. $\angle 1$ and $\angle 3$ are complementary	3.
4. $\angle 1 \cong \angle 4$	4.
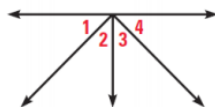
22. **Given**: $AB = CD$

    Prove: $AC = BD$

A   B   C   D

Statements	Reasons
1. AB = CD	1.
2. BC = BC	2.
3. AB + BC = CD + BC	3.
4. AB + BC = AC	4.
5. CD + BC = BD	5.
6. AC = BD	6.