

Name the property of equality the statement illustrates.

1. Segment Add. Post. If  $A, B,$  and  $C$  are collinear, then  $AC = AB + BC$ .
2. Transitive  $m\angle 4 = m\angle 8$  and  $m\angle 8 = m\angle 10$ , then  $m\angle 4 = m\angle 10$ .
3. Symmetric  $GE = OM$ , then  $OM = GE$ .
4. Subtr. If  $AB = CD$ , then  $AB - EF = CD - EF$
5. Symmetric If  $WX = YZ$ , then  $YZ = WX$ .
6. Trans If  $m\angle D = m\angle E$  and  $m\angle E = 45^\circ$ , then  $m\angle D = 45^\circ$ .

Use the property to complete the statement.

7. Reflexive Property of Angle Measure:  $m\angle C =$   $m\angle C$
8. Transitive Property of Equality: If  $CD = GH$  and  $GH = RS$ , then  $CD = RS$
9. Addition Property of Equality: If  $x = 5$ , then  $14 + x =$   $14 + 5$  or  $19$
10. Symmetric Property of Equality: If  $BC = RL$ , then  $RL = BC$
11. Substitution Property of Equality: If  $m\angle B = 15^\circ$ , then  $3(m\angle B) =$   $3(15)$  or  $45^\circ$

Solve the equation. Write a reason for each step.

12.  $3x + 8 = 14$   
 $3x = 6$  Subtr  
 $x = 2$  Div
13.  $-12x = 28 - 16x$   
 $4x = 28$  Add  
 $x = 7$  Div.
14.  $7(x - 11) = 12x - 122$   
 $7x - 77 = 12x - 122$  Distr.  
 $7x + 45 = 12x$  Add  
 $45 = 5x$  Subtr.  
 $9 = x$  Div.  
 $x = 9$  Symm.

Complete the logical argument by giving a reason for each step.



1.  $AB = BC$

Given

$$AC = AB + BC$$

$$\downarrow$$

$$AC = AB + AB$$

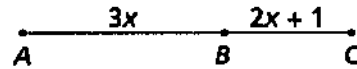
$$AC = 2(AB)$$

a. Seg. Add. Post.

b. Subst.

c. Simplify

2. Given:  $AC = 36$ ,  $AB = 3x$ , and  $2x + 1 = BC$



$$AC = 36, AB = 3x, \text{ and } 2x + 1 = BC$$

a. Given

$$AB + BC = AC$$

b. Seg. Add. Post.

$$3x + 2x + 1 = 36$$

c. Subst.

$$5x + 1 = 36$$

d. Simplify

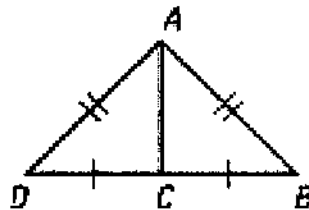
$$5x = 35$$

e. Subtr.

$$x = 7$$

f. Div.

3. **Given**  $AD = AB, DC = CB$   
**Show that the perimeter of  $\triangle ABC$  is equal to the perimeter of  $\triangle ABD$ .**



$$AD = AB, DC = CB$$

a. Given

$$AC = AC$$

b. Reflexive

$$AD + DC + AC = AB + CB + AC$$

c. Add.