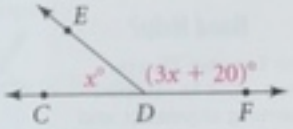
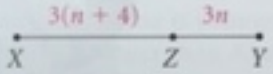
Algebra **Fill in the reason that justifies each step.**



1. Solve for x.

$m\angle CDE + m\angle EDF = 180$	**a.** ?
$x + (3x + 20) = 180$	**b.** ?
$4x + 20 = 180$	**c.** ?
$4x = 160$	**d.** ?
$x = 40$	**e.** ?

2. Solve for n.



Given: $XY = 42$

$XZ + ZY = XY$	**a.** ?
$3(n + 4) + 3n = 42$	**b.** ?
$3n + 12 + 3n = 42$	**c.** ?
$6n + 12 = 42$	**d.** ?
$6n = 30$	**e.** ?
$n = 5$	**f.** ?

Algebra **Give a reason for each step.**

3.

$\frac{1}{2}x - 5 = 10$	Given
$2\left(\frac{1}{2}x - 5\right) = 20$	**a.** ?
$x - 10 = 20$	**b.** ?
$x = 30$	**c.** ?

4.

$5(x + 3) = -4$	Given
$5x + 15 = -4$	**a.** ?
$5x = -19$	**b.** ?
$x = -\frac{19}{5}$	**c.** ?

Example 3 (page 91)

Name the property that justifies each statement.

5. $\angle Z \cong \angle Z$

6. $2(3x + 5) = 6x + 10$

7. If $12x = 84$, then $x = 7$.

8. If $\overline{ST} \cong \overline{QR}$, then $\overline{QR} \cong \overline{ST}$.

9. If $m\angle A = 15$, then $3m\angle A = 45$.

10. $XY = XY$

11. If $3x + 14 = 80$, then $3x = 66$.

12. If $KL = MN$, then $MN = KL$.

13. If $2x + y = 5$ and $x = y$, then $2x + x = 5$.

14. If $AB - BC = 12$, then $AB = 12 + BC$.

15. If $\angle 1 \cong \angle 2$ and $\angle 2 \cong \angle 3$, then $\angle 1 \cong \angle 3$.

y Your Skills

Use the given property to complete each statement.

16. Addition Property of Equality
If $2x - 5 = 10$, then $2x =$?.

17. Subtraction Property of Equality
If $5x + 6 = 21$, then ? $= 15$.

18. Symmetric Property of Equality
If $AB = YU$, then ?.

19. Symmetric Property of Congruence
If $\angle H \cong \angle K$, then ? $\cong \angle H$.

20. Reflexive Property of Congruence
$\angle PQR \cong$?

21. Distributive Property
$3(x - 1) = 3x -$?

22. Substitution Property
If $LM = 7$ and $EF + LM = NP$, then ? $= NP$.

23. Transitive Property of Congruence
If $\angle XYZ \cong \angle AOB$ and $\angle AOB \cong \angle WYT$, then ?.

24. Multiplication Property of Equality
If $\frac{1}{3}TR = UW$, then ?.

lp?

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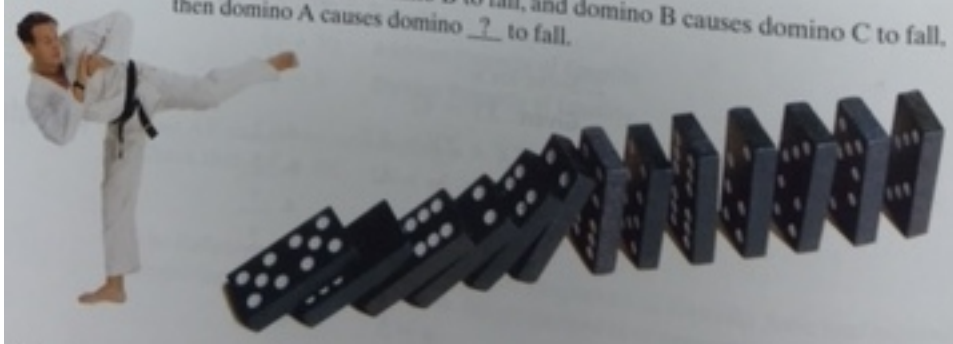
and 27).

25. Writing Jero claims that the statements $\overline{LR} \cong \overline{RL}$ and $\angle CBA \cong \angle ABC$ are both true by the Reflexive Property of Congruence. Explain why Jero is correct.

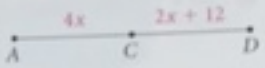
26. Use what you know about transitive properties to complete the following:

The Transitive Property of Falling Dominoes:

If domino A causes domino B to fall, and domino B causes domino C to fall, then domino A causes domino ? to fall.



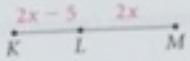
27. Algebra Fill in the reason that justifies each step.



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

C is the midpoint of $\overline{AD}$.	a. ?
$AC = CD$	b. ?
$4x = 2x + 12$	c. ?
$2x = 12$	d. ?
$x = 6$	e. ?

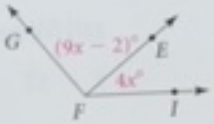
28. Algebra In the figure at the right, $KM = 35$.



a. Solve for x. Justify each step.
b. Find the length of $\overline{KL}$.

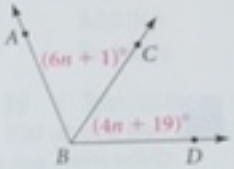
Reading Math
For help with reading and solving Exercise 28, see p. 95.

29. Algebra In the figure at the right, $m\angle GFI = 128$.



a. Solve for x. Justify each step.
b. Find $m\angle EFI$.

30. Algebra Fill in the reason that justifies each step.



Given: $\overrightarrow{BC}$ bisects $\angle ABD$.

$\overrightarrow{BC}$ bisects $\angle ABD$.	a. ?
$m\angle ABC = m\angle CBD$	b. ?
$6n + 1 = 4n + 19$	c. ?
$2n = 18$	d. ?
$n = 9$	e. ?

Challenge

31. Error Analysis The steps below "show" that $1 = 2$. Find the error.

Given: $a = b$

$a = b$	Given
$ab = b^2$	Multiplication Property of Equality
$ab - a^2 = b^2 - a^2$	Subtraction Property of Equality
$a(b - a) = (b + a)(b - a)$	Distributive Property
$a = b + a$	Division Property of Equality
$a = a + a$	Substitution Property
$a = 2a$	Simplify.
$1 = 2$	Division Property of Equality

Real-World Connection
President Calvin Coolidge, advice columnist Ann Landers, and musician Bill Withers were all born on the Fourth of July. Each one of them "has the same birthday as" either one of the others.

Relationships **You know that the relationships "is equal to" and "is congruent to" are reflexive, symmetric, and transitive. In a later chapter, you will see that this is also true for the relationship "is similar to." Consider the following relationships among people. State whether each relationship is reflexive, symmetric, transitive, or none of these.**

Sample: The relationship "is younger than" is transitive. If Sue is younger than Fred and Fred is younger than Alana, then Sue is younger than Alana. The relationship "is younger than" is not reflexive because Sue is not younger than herself. It is also not symmetric because if Sue is younger than Fred, Fred is not younger than Sue.

32. has the same birthday as
33. is taller than
34. lives in the same state as
35. lives in a different state than
36. is the same height as
37. is a descendant of