Warm Up 24

1. Syllogism

2. a. subtraction

   b. multiplication

   c. squaring an expression

3. A

4. Converse: If a parallelogram is a rhombus, then all of its sides are congruent.
   Inverse: If all the sides of a parallelogram are not congruent, then it is not a rhombus.

Lesson Practice 24

a.

$x + 5 = 4x + 2$	Given
$x + 5 - 5 = 4x + 2 - 5$	Subtraction Property of Equality
$x = 4x - 3$	Simplify
$x - 4x = 4x - 3 - 4x$	Subtraction Property of Equality
$-3x = -3$	Simplify
$\frac{-3x}{-3} = \frac{-3}{-3}$	Division Property of Equality
$x = 1$	Simplify

b.

$\frac{4x + 5}{3} = \frac{5x + 7}{4}$	Given
$12\left(\frac{4x + 5}{3}\right) = 12\left(\frac{5x + 7}{4}\right)$	Multiplication Property of Equality
$16x + 20 = 15x + 21$	Distributive Property
$16x + 20 - 20 = 15x + 21 - 20$	Subtraction Property of Equality
$16x = 15x + 1$	Simplify
$16x - 15x = 15x + 1 - 15x$	Subtraction Property of Equality
$x = 1$	Simplify

c. The correct order is:

$\frac{2}{3}x + 6 = 4 - 2x$	Given
$3\left(\frac{2}{3}x + 6\right) = 3(4 - 2x)$	Multiplication Property of Equality
$2x + 18 = 12 - 6x$	Simplify
$2x + 18 - 18 = 12 - 6x - 18$	Subtraction Property of Equality

$$2x = -6 - 6x \quad \text{Simplify}$$
$$2x + 6x = -6 - 6x + 6x \quad \text{Addition Property of Equality}$$
$$8x = -6 \quad \text{Simplify}$$
$$\frac{8x}{8} = \frac{-6}{8} \quad \text{Division Property of Equality}$$
$$x = -\frac{2}{3} \quad \text{Simplify}$$

d. $A = 40$, $l = (x + 2)$, and $w = (x - 1)$ Given

$$A = lw \quad \text{Area formula for a rectangle}$$
$$40 = (x + 2)(x - 1) \quad \text{Substitution Property of Equality}$$
$$40 = x^2 + x - 2 \quad \text{Simplify}$$
$$40 - 40 = x^2 + x - 2 - 40 \quad \text{Subtraction Property of Equality}$$
$$0 = x^2 + x - 42 \quad \text{Simplify}$$
$$x^2 + x - 42 = 0 \quad \text{Symmetric Property of Equality}$$
$$(x - 6)(x + 7) = 0 \quad \text{Factor}$$

The solution cannot come from $x + 7 = 0$, as the sides of the rectangle must be positive.

$$x - 6 = 0$$
$$x - 6 + 6 = 0 + 6$$
$$x = 6$$

Substitute to find the dimensions.

$$\text{length} = (x + 2) \text{ yd}$$
$$= (6 + 2) \text{ yd}$$
$$= 8 \text{ yd}$$
$$\text{width} = (x - 1) \text{ yd}$$
$$= (6 - 1) \text{ yd}$$
$$= 5 \text{ yd}$$

The length is 8 yd and the width is 5 yd.

Practice 24

1. horizontal: 16 inches; vertical: 12 inches

2. If the angles are supplementary, then by the Same-Side Interior Angles Theorem, the shelves are parallel.

3. Converse: If two lines are cut by a transversal and the same side-interior angles are supplementary, then the lines are parallel. Yes this is true.

4. They are both correct, as the Distributive Property can be avoided if the Division Property of Equality is used first.

5. If the window is not closed, then it is open; The converse is true.

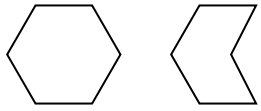
6. C

7. 32 ft

8. The sum of the interior and its adjacent exterior angle at any vertex of a polygon is always 180°.

9. 10 ft^2 each

10. Sample answer:



11. If the school receives a new computer lab from the district, then all of the students in the school achieved over 70% on the state exams; The converse is not necessarily true.

12. obtuse; the diagonals form a linear pair of angles, so the other triangles each have a 120° angle

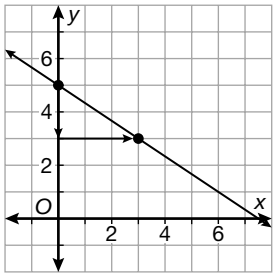
13.

$2x - 1 = 5$	Given
$2x - 1 + 1 = 5 + 1$	Addition Property of Equality
$2x = 6$	Simplify.
$\frac{2x}{2} = \frac{6}{2}$	Division Property of Equality
$x = 3$	Simplify.

14. D

15. 25

16.



17. 364 ft^2

18. 942 ft

19. 8 in.

20. If it is not raining, then I will not use my umbrella. This inverse may be true, but you might have reasons to carry an umbrella when it is not raining.

21. 480 m^2

22. Sample: interior $\angle ABC$; exterior: $\angle XEA$

23. (10, −3)

24. Both the angle the box inclines and the angle of the ramp are complementary to angle ABC, so they are congruent; 30°

25. 28 ft^2

26. The slope of 30 represents the amount per month that must be paid for the membership; $350

27. There may be birds without brown feathers that have not been seen.

28. Conclusion: The angle cannot be acute. This conclusion uses the Law of Detachment.

29. $y = \frac{1}{2}x + 2\frac{1}{2}$

30. She is incorrect; she is not following the Order of Operations.