Name: _____   Date: _____

# 🌊 🍉 **Geometry Summer Work** ☀️ ⛱️

Directions: Do your best to complete all problems. Show all work. You may use a calculator, tracing paper, a compass, straightedge, and protractor. This will count for your first quiz grade of the year (quizzes are 5 points and you will have about 2 take home quizzes per week). This will be graded for completion, effort, and accuracy. Due on the first full day of class Wednesday September 3.

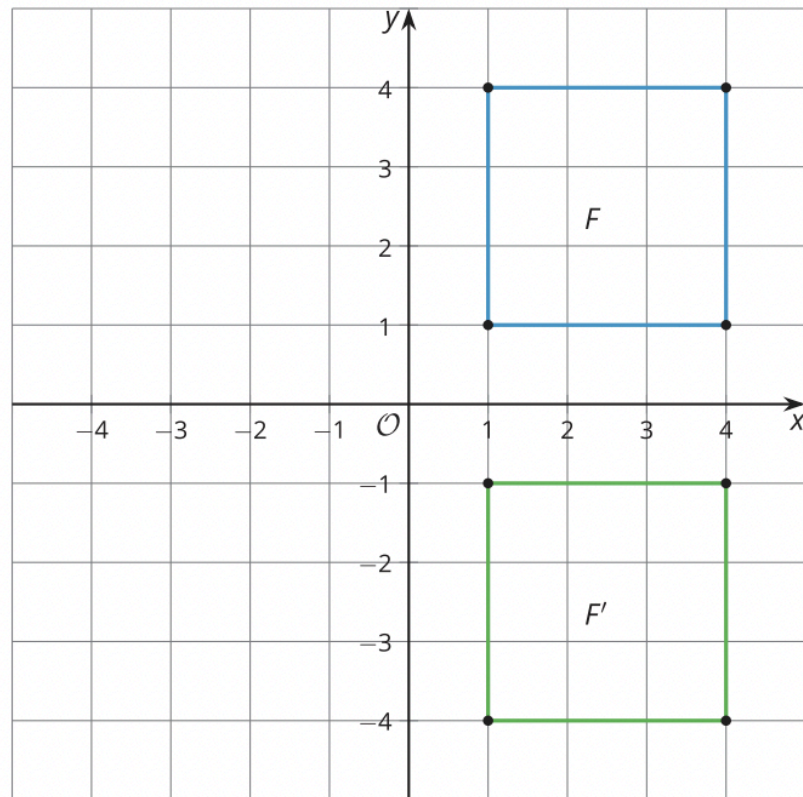1. Label each diagram with its triangle type (equilateral, isosceles, scalene).
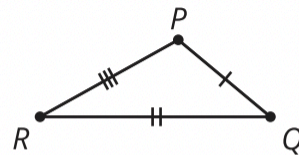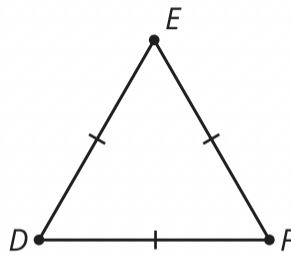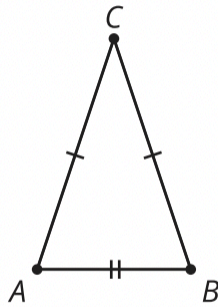
2. Draw a rectangle. Explain how you know your shape is a rectangle.

3. What is the measure of angle B?
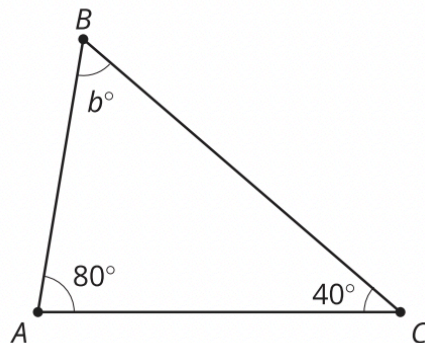
4. Select **all** transformations that take figure F to figure F'.

A. Reflect figure F across the x-axis.

B. Reflect figure F across the y-axis.

C. Rotate figure F 90 degrees clockwise around the origin.

D. Rotate figure F 180 degrees counterclockwise around the origin.

E. Translate figure F so that $(4, 1)$ goes to $(4, -1)$.

F. Translate figure F so that $(1, 4)$ goes to $(1, -1)$.

5. Select **all** transformations that take rectangle $ABCD$ onto itself.
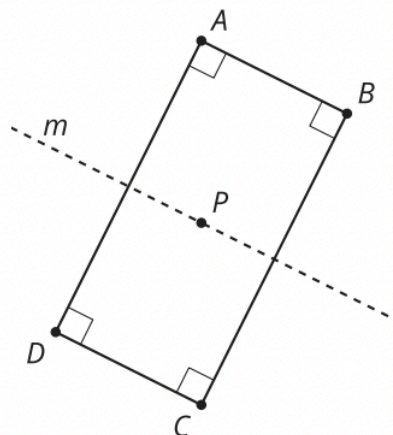
A. Rotate by 90 degrees clockwise using center P.

B. Rotate by 180 degrees clockwise using center P.

C. Reflect across line m.

D. Reflect across diagonal AC.

E. Translate by the directed line segment from A to B.

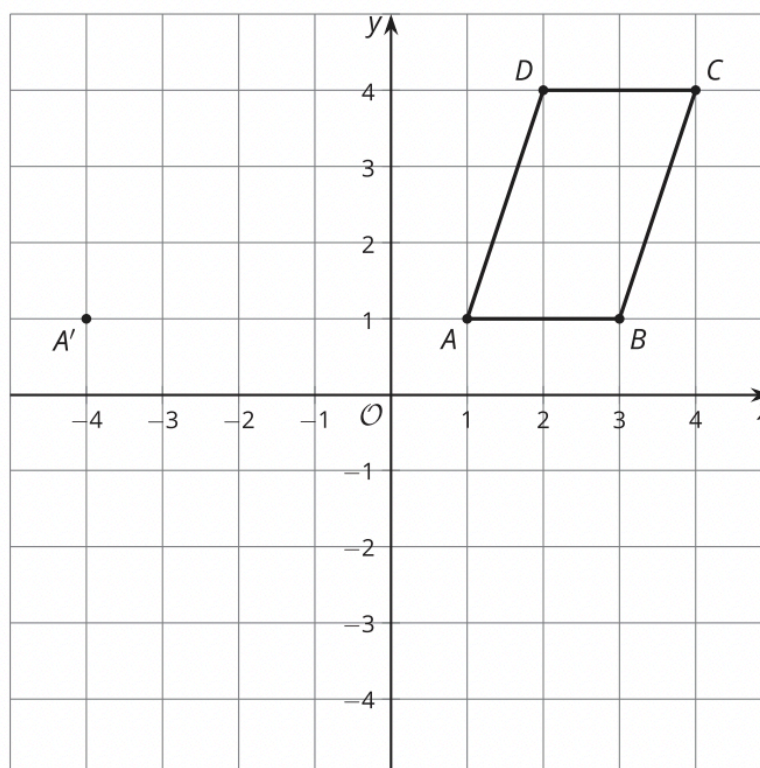6. Is there a rigid transformation taking Rhombus P to Rhombus Q? Explain how you know.
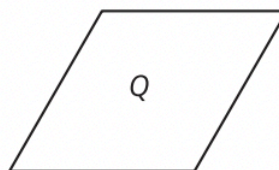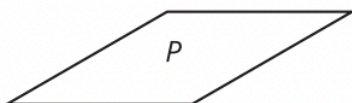
7. Bisect segment AB by plotting the midpoint.
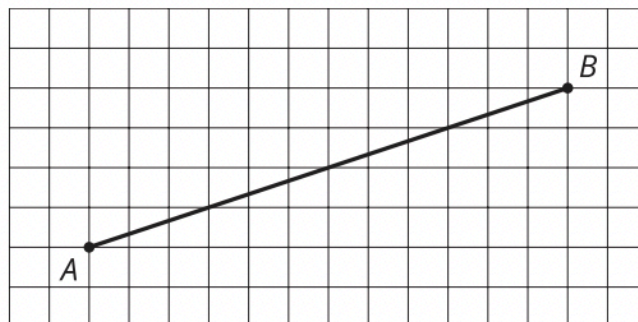
8. a. Draw the image of quadrilateral $ABCD$ after a translation that takes A to A'. Label the image $A'B'C'D'$.
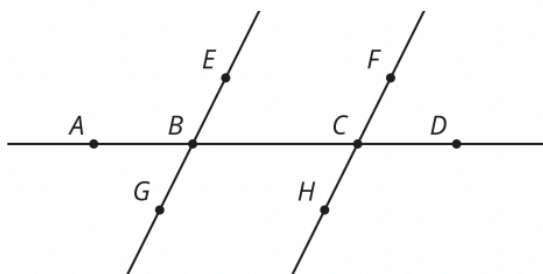
    b. Draw the image of quadrilateral $ABCD$ after a rotation 90 degrees clockwise around the origin. Label the image $A''B''C''D''$.

9. Lines EG and FH are parallel.

    a. Name all the angles congruent to angle ABE.

    b. Write an equation that represents the relationship between angle FCD and angle HCD.

10. ***Hint #1: Draw this out!**
*Hint #2: "bisect" means to cut in half.

Triangle $A'B'C'$ is a reflection of triangle ABC across line ℓ. Select **all** statements that must be true.

    A. Line ℓ bisects segment AB.

    B. Line ℓ bisects segment CC'.

    C. Angle ABC is 60 degrees.

    D. Line BB' is perpendicular to line ℓ.

    E. Angle ABC is congruent to angle $A'B'C'$.

    F. Triangles ABC and $A'B'C'$ are congruent.

    G. Segment BC is congruent to segment $B'C'$.

    H. The distance from point A to line ℓ is the same as the distance from point A' to line ℓ.

11.

In parallelogram $ABCD$, the measure of angle A is $99°$. Explain why the measure of adjacent angle B must be $81°$.

12.

Find the values of $v, w, x, y,$ and z.
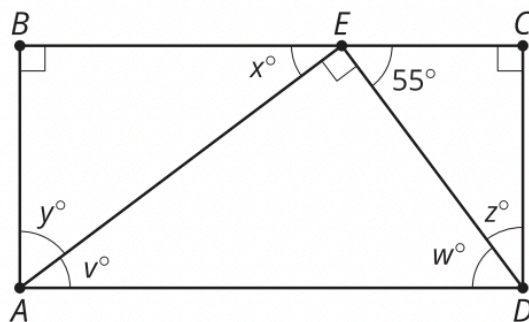
13. **Hint: Draw this out!**

In triangle ABC, the measure of angle A is $90°$. The length of AB is 1 unit. The length of AC is 8 units. Find the length of BC.
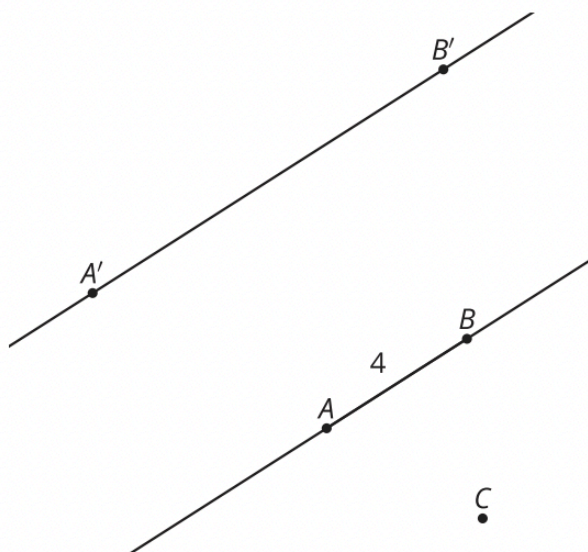
14.

Find the value of x that makes the equation true. Explain or show your reasoning.

$$\frac{12}{x} = \frac{8}{6}$$

15.

Dilating point A using center C and scale factor 2.5 gives image A'. Dilating point B using center C and scale factor 2.5 gives image B'.
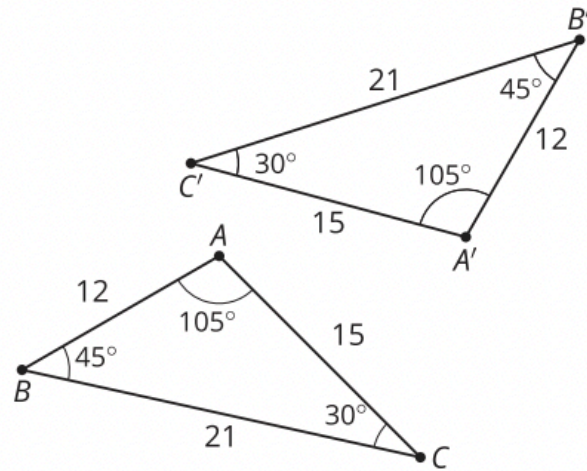

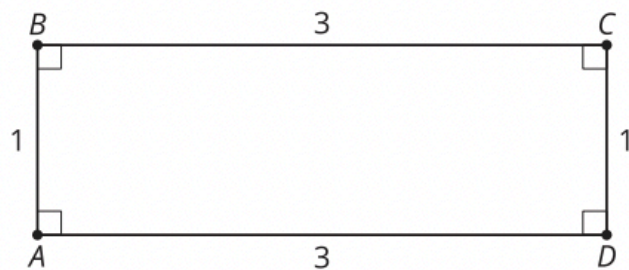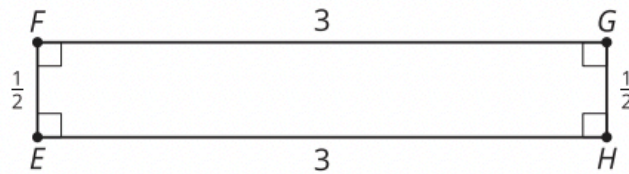
a. What can you say about line AB and line $A'B'$?

b. What is the length of segment $A'B'$?

16.

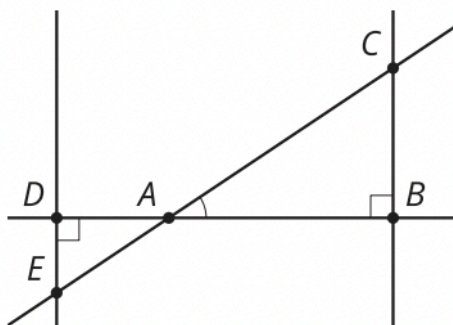For each pair of figures, state whether they are similar or not similar. Show or explain how you know.

a.

b.

17. **Hint: complementary angles add up to 90°.**

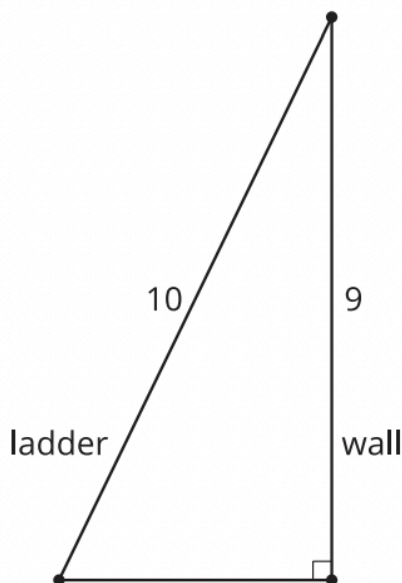Which angle is complementary to angle BAC?

A. angle ACB

B. angle CAD

C. angle CBA

D. angle DAE

18. *Hint: You may want to use a special *Theorem* for right triangles!
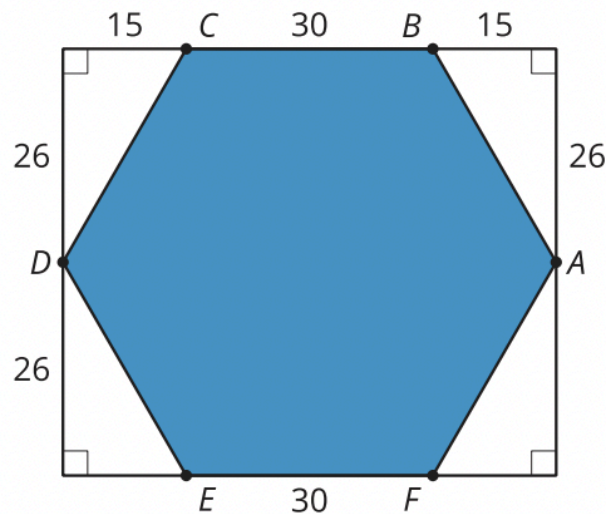
A 10-foot tall ladder is placed against a wall so that the top of the ladder is 9 feet above the ground. How far is the base of the ladder from the base of the wall along the ground? Explain or show your reasoning.

19. *Hint: Area of a triangle = $\frac{1}{2}bh$

What is the area of regular hexagon $ABCDEF$? Explain or show your reasoning.

20.

Select **all** quantities that equal π.

A. the circumference of a circle of radius 1

B. the circumference of a circle of diameter 1

C. the diameter of a circle of radius 1

D. the diameter of a circle of circumference 1

E. the area of a circle of radius 1

F. the area of a circle of diameter 1

Hint: Area = π•r² and Circumference=π•d

21.

Solve each equation.
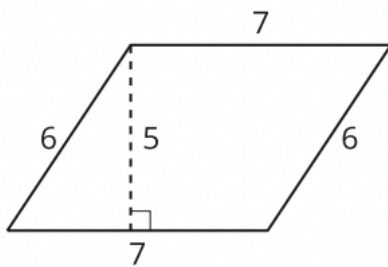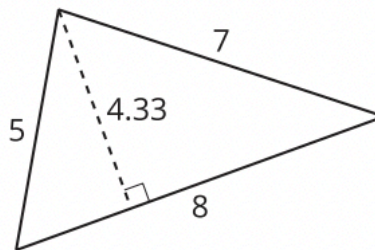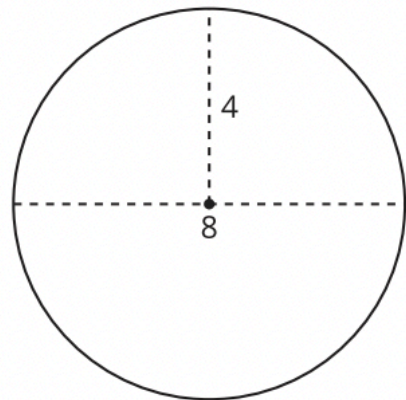
$$\frac{x}{7} = 0.4 \qquad\qquad\qquad \frac{7}{y} = 0.4$$

22.

A **B** **C**

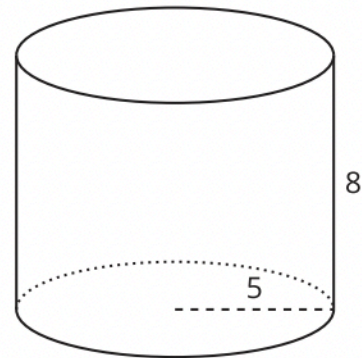

Find the area of each shape. All measurements are in meters.

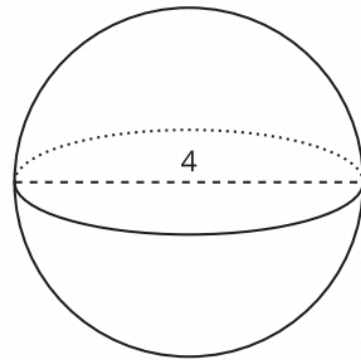Hint: Triangle area = (½)•B•h   Parallelogram area = B•h

23.

Find the volume of the cylinder. Explain or show your reasoning. All measurements are in centimeters.

8

5

24.

The volume formula for a sphere is $V = \frac{4}{3}\pi r^3$ where r is the length of the sphere's radius. Find the volume of the sphere in the image. Measurements are in inches.
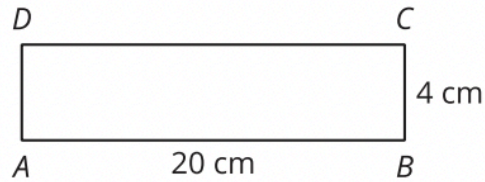

4

25.

a. A square has area 225 square meters. What is the length of a side of the square?

b. A cube has volume 64 cubic feet. What is the length of an edge of the cube?

26.

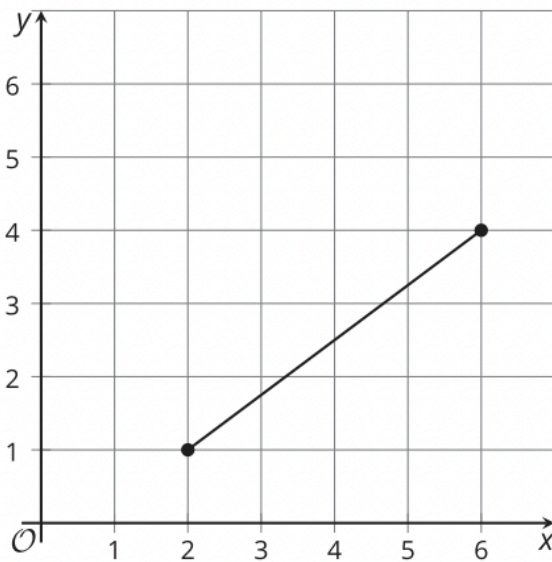This rectangle has area 80 square centimeters.

The rectangle is dilated using A as a center and a scale factor of $\frac{1}{2}$. What is the area of the image?

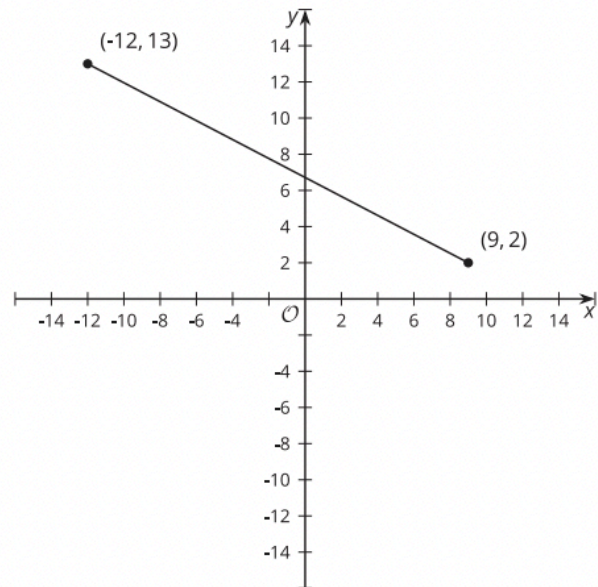27.

Two line segments are graphed.

A

B

Calculate the length of each line segment.

*Hint: Think about making a right triangle with these segments where the segments are the hypotenuse.
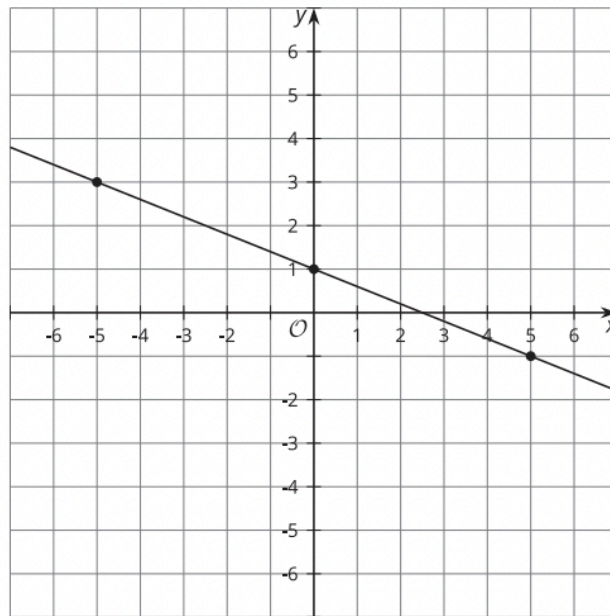
28.

Find the slope of each line.
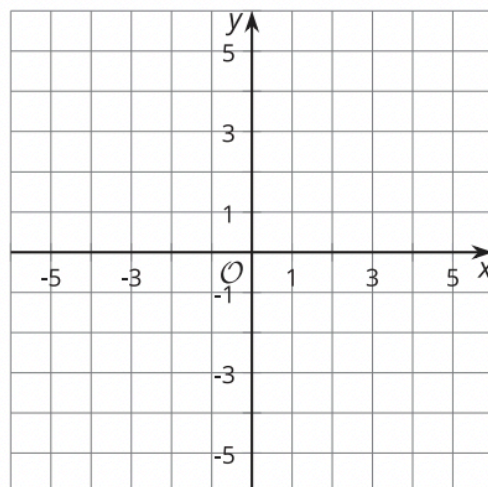
a. $y = \frac{2}{3}x + 10$

b. $6x + 2y = 5$

c. the line in the image

29.

Graph the line that represents the equation $y = -\frac{1}{2}x + 1$.

13

30. Rewrite each expression using the distributive property.

 a. $(x - 4)(x + 6)$

 b. $(x + 7)(x + 7)$

 c. $(x - 3)^2$

31. Rewrite each expression in factored form.

 a. $x^2 - 3x - 10$

 b. $x^2 + 6x + 9$

32. The radius of a circle measures 12 centimeters.

 a. What is the circumference of the circle?

 b. What is the area of the circle?