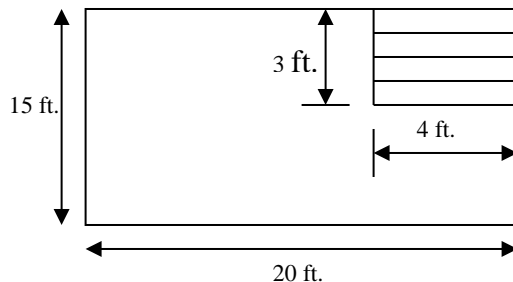


## Geometry: Area/Circumference Word Problems—Practice

For  $\pi$ , use 3.14

1. I have a circular pool that has a radius of 9 feet. How much fence must I buy to enclose the pool?
2. One wall of a room to be painted is 12 feet long and 9 feet high. There is a door and a window in the wall. The door is 6 feet high and 3 feet wide. The window is 3 feet high by 2 feet wide. If a can of paint covers 20 square feet, how many cans of paint are required?
3. A rectangular lawn measures 50 feet by 25 feet and has three flower beds. One of the beds is circular with an 8 foot diameter, one is a 7 foot square and the third is rectangular with a width 9 feet and a length that is 3 times its width.
  - a. If a bag of mulch covers 90 square feet, how many bags are required to cover the flower beds?
  - b. It is desired to put a fence around each of the mulched areas. How many feet of fence are required?
  - c. What is the area of the lawn not covered by mulch?
  - d. If a bag of lawn seed covers 100 square feet, how many are needed to cover the area not covered by mulch?

4. The floor plan of a room is as follows:



- a. It is desired to carpet the floor, but not the stairs. How many square feet of carpet are required?
  - b. Baseboard is to be placed around the perimeter of the carpet. How many feet of baseboard are required?
5. A plot of land is 180 feet long and 121 feet wide. An acre is 43,560 square feet. How many acres does the plot contain?
  6. It is desired to fence in a circular pool that has a radius of 8 feet. This fence is to 6 feet from the edge of the pool.
    - a. How many feet of fence are needed?
    - b. What is the area between the fence and the pool?

7. A painting is 38 inches long and 18 inches wide. There is a 3 inch frame all around the painting.
  - a. What is the area of the frame in square inches?
  - b. What is the area of the frame in square feet? (round to nearest tenth)
8. If the perimeter of a rectangle is 36 inches and one side is 6 inches long, what is the area of the rectangle?
9. My neighbor wants to fence in two-thirds of his backyard for a dog run. His backyard is 9,000 square feet in area and one side of the proposed dog run is 100 feet long. How many feet of fence does he need?
10. Given a triangle with all sides the same length, the height is 6 inches and the area is 36 square inches. What is the perimeter of the triangle?
11. I have a cabinet drawer that is 6 inches wide, 12 inches long and 4 inches high. To cover the inside with contact paper, how many square inches of contact paper is required?
12. A container has the shape of a right-circular cylinder. It's diameter is 3 feet and stands 4 feet high. The entire outside surface is to be painted, and each can of paint covers 25 square feet.
  - a. How many square feet are to be painted?
  - b. How many cans of paint are needed?

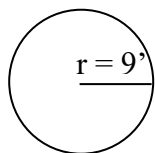
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**Answer Key—See following pages to see “how to do” these problems**

- |                       |                          |
|-----------------------|--------------------------|
| 1. 56.52 feet         | 7. a. 372 square inches  |
| 2. 5 cans             | b. 2.6 square feet       |
| 3. a. 4 bags          | 8. 72 square inches      |
| b. 125.12 feet        | 9. 320 feet              |
| c. 907.76 square feet | 10. 36 inches            |
| d. 10 bags            | 11. 216 square inches    |
| 4. a. 288 square feet | 12. a. 51.81 square feet |
| b. 70 feet            | b. 3 cans                |
| 5. .5 acre            |                          |
| 6. a. 87.92 feet      |                          |
| b. 414.48 square feet |                          |

# Geometry: Area/Circumference Word Problems—Practice Answer Key

1.



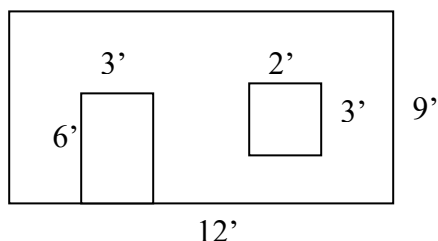
$$\begin{aligned} C &= 2\pi r \\ &= 2(3.14)(9) \\ \boxed{C} &= \boxed{56.52 \text{ feet}} \end{aligned}$$

Distance around the pool is circumference.

$$C = \pi d \text{ or } C = 2\pi r$$

Since we have 'r' use  $C = 2\pi r$

2.



1<sup>st</sup> find the area of the wall.

$$A = L \times W = 9 \times 12 = 108 \text{ ft}^2$$

2<sup>nd</sup> subtract the area of the window and of the door from the area of the wall.

$$\text{A window} = 2 \times 3 = 6 \text{ ft}^2$$

$$\text{A door} = 3 \times 6 = 18 \text{ ft}^2$$

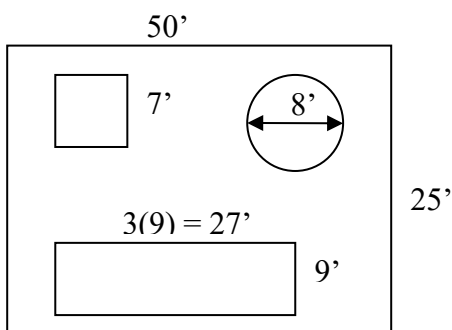
A wall – A window – A door =

$$108 - 6 - 18 = 84 \text{ ft}^2$$

Each can covers  $20 \text{ ft}^2$ , so divide 84 by 20.

$$\begin{array}{r} 4.2 \\ 20 \overline{)84.0} \end{array} \quad \text{4 cans will not be enough, so we'll need } \boxed{5 \text{ cans.}}$$

3.



A. 1. Find the area of each flower bed and total them.

$$\text{A square} = 7^2 = 49$$

$$\text{A rectangle} = 27 \times 9 = 243$$

$$\text{A circle} = \pi (4)^2 = (3.14)(16) \approx 50.24$$

$$\text{Total} \approx 342.24$$

2. Divide total by 90

$$342.24 \div 90 = 3.8 \text{ round up to whole number, so we need } \boxed{4 \text{ bags}}$$

B. Find the perimeter of each bed and total them.

$$P \text{ square} = 4 \times 7 = 28$$

$$P \text{ rectangle} = 2(27) + 2(9) = 72$$

$$C \text{ circle} = (3.14)(8) \approx 25.12$$

$$\boxed{\text{Total} \approx 125.12 \text{ ft.}}$$

C. Find the area of lawn and subtract total from part (A).

$$A \text{ lawn} = 50 \times 25 = 1250$$

$$\begin{array}{r} 1250 \\ - 342.24 \\ \hline \end{array}$$

$$\boxed{907.76 \text{ sq. ft.}}$$

D. Divide answer from part (C) by 100.

$$907.76 \div 100 = 9.0776 \text{ round up to } \boxed{10 \text{ bags}}$$

4. A. Find the area of the room minus the area of the stairs.

$$A \text{ room} = 15 \times 20 = 300$$

$$A \text{ stairs} = 3 \times 4 = 12$$

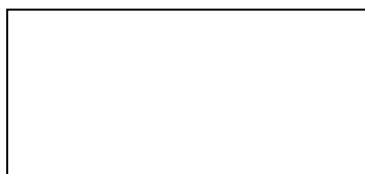
$$\boxed{A = 288 \text{ sq. ft.}}$$

B. Find the perimeter of the room

$$P = 2(15) + 2(20) = 70 \text{ ft.}$$

$$\boxed{P = 70 \text{ ft.}}$$

5.



121 ft.

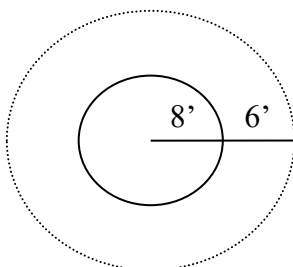
180 ft.

A. Find the area

$$A = 180 \times 121 = 21,780 \text{ sq. ft.}$$

B.  $21,780 \div 43,560 = \boxed{.5 \text{ acre}}$

6.



$$\text{Radius of outer circle} = 8 + 6 = 14'$$

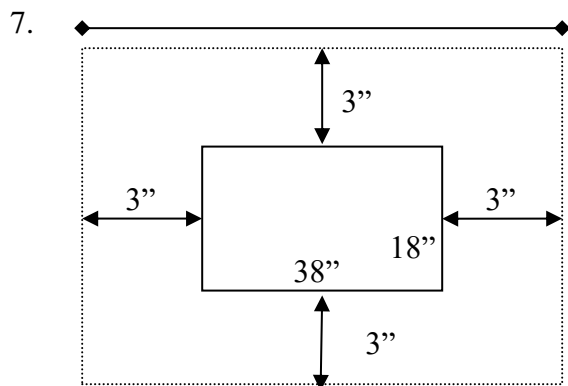
$$\begin{array}{r} C = 2 \pi r = 2(3.14)(14) \\ = \boxed{87.92 \text{ ft. of fence}} \end{array}$$

Find the difference between the outer circle's area and inner circle's area.

$$A_{\text{outer}} = 3.14 (14)^2 = 615.44$$

$$A_{\text{inner}} = 3.14 (8)^2 = 200.96$$

$$\boxed{414.48 \text{ sq. ft.}}$$



Find the area of the picture and frame; then subtract the area of the picture.

Area of the picture and frame:

$$\text{top} = 38 + 3 + 3 = 44$$

$$\text{side} = 18 + 3 + 3 = 24$$

$$\text{area} = 44 \times 24 = \mathbf{1056 \text{ sq. in.}}$$

Area of the picture:

$$\text{top} = 38$$

$$\text{side} = 18$$

$$\text{area} = 38 \times 18 = \mathbf{684 \text{ sq. in.}}$$

$$\text{Area of the frame} = 1056 - 684$$

$$= \mathbf{372 \text{ total sq. in.}}$$

$$1 \text{ sq. foot} = 12 \times 12 = 144 \text{ sq. inches}$$

$$372 \div 144 \approx \boxed{2.6 \text{ sq. ft.}}$$

8. The perimeter of a rectangle (P) is calculated as follows:  $P = 2L + 2W$  where

L

$$\boxed{\phantom{000000}} \quad W = 6''$$

The area of the rectangle (A) is:  $A = L \times W$ . We want to find the area, but only one side is known. However, knowing the perimeter and one side, it is possible to calculate the other side.

$$P = 2L + 2W$$

$$36 = 2L + 2(6)$$

$$= 2L + 12$$

$$-12 + 36 = 2L + 12 - 12$$

$$\frac{24}{2} = \frac{2L}{2}$$

$$12 = L$$

Now the length and width are known for the Area.

$$A = L \times W$$

$$= 12 (6)$$

$$\boxed{A = 72 \text{ sq. in.}}$$

9. The lot size is 9000 sq. ft. and only  $\frac{2}{3}$  is to be fenced. So the area fenced is

$\frac{2}{3}(9000) = 6000$  sq. ft. Since one dimension is 100 ft. and the area is 6000 sq. ft.,

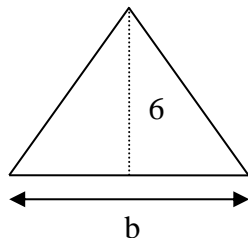
$$\begin{aligned} A &= LW \\ \frac{6000}{100} &= \frac{100W}{100} \end{aligned}$$

The amount of fence is the perimeter, which is  $P = 2L + 2W$

$$\begin{aligned} P &= 2(100) + 2(60) \\ &= 200 + 120 \end{aligned}$$

$$\boxed{P = 320 \text{ ft.}}$$

10.



The area of a triangle is given by:  $A = \frac{1}{2}bh$  where  $b = \text{base}$

$h = \text{height}$

So, with an area of 36 sq. in. and a height of 6 in., the base is:

$$36 = \frac{1}{2}b(6)$$

$$2(36) = 2\left(\frac{1}{2}b(6)\right)$$

$$72 = b(6)$$

$$\frac{72}{6} = \frac{b(6)}{(6)}$$

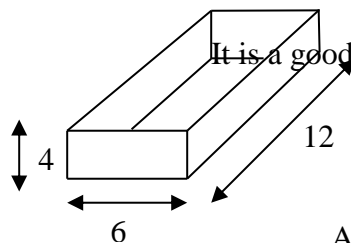
$$12 \text{ in.} = b$$

Since all of the sides are the same length, the perimeter is

$$P = 3(12)$$

$$\boxed{P = 36 \text{ in.}}$$

11.



It is a good idea to sketch the drawer. To cover the

inside, we need area of the bottom, two sides, and the front and back. These are all rectangles, so:

$$A = LW$$

$$A (\text{bottom}) = 6(12) = 72$$

$$A (\text{one side}) = 4(12) = 48$$

$$A (\text{front}) = 4(6) = 24$$

Since there are two sides and the front and back are the same, the total area is:

$$\begin{aligned} A (\text{total}) &= 72 + 2(48) + 2(24) \\ &= 72 + 96 + 48 \end{aligned}$$

$$\boxed{A = 216 \text{ sq. in.}}$$

12. Again, it is a good idea to sketch the cylinder. To find the number of cans of paint needed, the total area to be painted must be known.

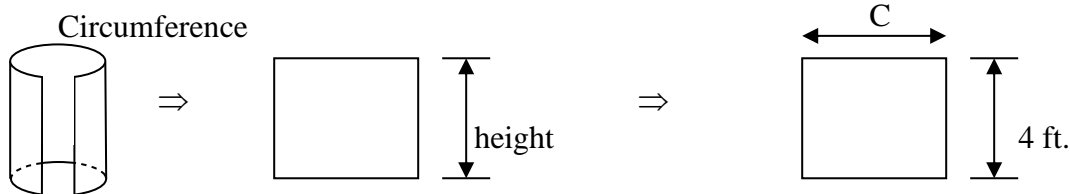
The top and bottom are circles with a known diameter.

$$\begin{array}{rcl}
 A & = & \pi r^2 \text{ where } \pi = 3.14 \\
 r & = & \frac{d}{2} = \frac{3}{2} = 1.5 \\
 \text{so, } A(\text{top}) & = & 3.14(1.5)^2 \\
 & = & 3.14(2.25) \\
 & = & 7.065 \text{ sq. ft.}
 \end{array}
 \begin{array}{rcl}
 & & 1.5 \qquad 2.25 \\
 & & \times 1.5 \qquad \times 3.14 \\
 & & 2.25 \qquad 7.0650
 \end{array}$$

Both the top and bottom are to be painted.

$$A(\text{top and bottom}) = 2(7.065) = 14.13 \text{ sq. ft.}$$

The side of the cylinder is a rectangle, where the cylinder height is one side, and the length of the other side is the circumference of the top (or bottom). If the cylinder was split and flattened out:



$$\begin{array}{l}
 \text{Now } C = \pi d \\
 C = 3.14(3) \\
 C = 9.42 \text{ ft.}
 \end{array}$$

So the area of the side is:

$$\begin{array}{rcl}
 A & = & 9.42(4) = 37.68 \text{ sq. ft.} \\
 & & 9.42 \\
 & & \times 4 \\
 & & \hline
 & & 37.68
 \end{array}$$

Thus the total area of the cylinder is:

$$\begin{array}{rcl}
 A(\text{total}) & = & A(\text{top}) + A(\text{bottom}) + A(\text{side}) \\
 & = & 7.065 + 7.065 + 37.68 \\
 & = & 51.81 \text{ sq. ft.}
 \end{array}$$

Each can of paint covers 25 sq. ft.

$$\begin{array}{r}
 2.07 \\
 25 \overline{) 51.81}
 \end{array}$$

So you must have 3 cans of paint.