

Grade 7 · Circumference and Area of Circles · Worksheet Answer Key

Common Core 7.G.B.4 · mathovore.fr

Each solution shows the radius, the formula, and the arithmetic with $\pi = 3.14$ unless the problem asks for an answer in terms of π . Compare every step with your own work, check units, and notice whether you squared only the radius in area problems.

Grade 7 Common Core: 7.G.B.4

Problem 1: Radius and diameter

The radius is half the diameter: $14 \div 2 = 7$.

The diameter is twice the radius: $9 \times 2 = 18$.

Radius 7 cm; **diameter** 18 in

Problem 2: Diameter and radius pairs

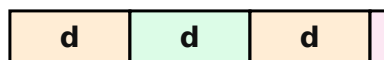
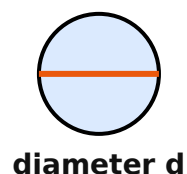
The radius is half the diameter, and the diameter is twice the radius.

- a. $22 \div 2 = 11$: 11 cm
- b. $15 \times 2 = 30$: 30 in
- c. $3.5 \div 2 = 1.75$: 1.75 ft

Problem 3: Circumference from the diameter

$$C = \pi d = 3.14 \times 10 = 31.4.$$

31.4 in



$$\text{rcumference} = 3 \text{ diameters} + 0.14 d$$

Figure 3. Circumference is about 3.14 times the diameter.

Problem 4: Labeled diameter

$$C = \pi d = 3.14 \times 25$$

$$3.14 \times 25 = 78.5$$

78.5 cm

Problem 5: Circumference from the radius

$$C = 2\pi r = 2 \times 3.14 \times 7 = 6.28 \times 7 = 43.96.$$

43.96 ft

Problem 6: Fence around a garden

The fence is the circumference: $C = 2\pi r = 2 \times 3.14 \times 12.$

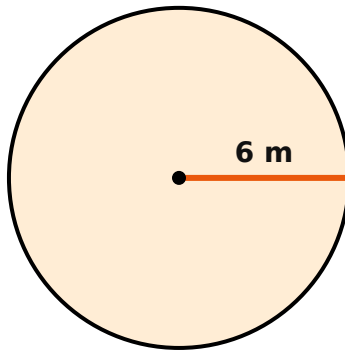
$$2 \times 3.14 = 6.28 \text{ and } 6.28 \times 12 = 75.36.$$

75.36 m

Problem 7: Area from the radius

$$A = \pi r^2 = 3.14 \times 6^2 = 3.14 \times 36 = 113.04.$$

113.04 m²



Solved: area is 3.14 times 36 = 113.04 square meters.

Problem 8: Labeled radius

$$A = \pi r^2 = 3.14 \times 9^2 = 3.14 \times 81$$

$$3.14 \times 81 = 254.34$$

$$254.34 \text{ in}^2$$

Problem 9: Area from the diameter

The radius is $20 \div 2 = 10$.

$$A = 3.14 \times 10^2 = 3.14 \times 100 = 314.$$

$$314 \text{ cm}^2$$

Problem 10: Circular patio

The radius is $16 \div 2 = 8$.

$$A = 3.14 \times 8^2 = 3.14 \times 64 = 200.96.$$

$$200.96 \text{ ft}^2$$

Problem 11: Answers in terms of pi

$$C = 2\pi r = 2 \times 8 \times \pi = 16\pi.$$

$$A = \pi r^2 = \pi \times 64 = 64\pi.$$

$$C = 16\pi \text{ cm and } A = 64\pi \text{ cm}^2$$

Problem 12: Exact answers with pi

$$C = 2\pi r = 2 \times 11 \times \pi = 22\pi.$$

$$A = \pi r^2 = \pi \times 121 = 121\pi.$$

$$C = 22\pi \text{ m and } A = 121\pi \text{ m}^2$$

Problem 13: Work backward from circumference

$$C = \pi d, \text{ so } d = C \div \pi = 62.8 \div 3.14 = 20.$$

The radius is $20 \div 2 = 10$.

Diameter 20 cm; **radius** 10 cm

Problem 14: Work backward from area

$$A = \pi r^2, \text{ so } r^2 = 706.5 \div 3.14 = 225.$$

$$15 \times 15 = 225, \text{ so } r = 15.$$

$$\text{Diameter: } 2 \times 15 = 30. \text{ Circumference: } C = 3.14 \times 30 = 94.2.$$

$$\text{Check: } 3.14 \times 15^2 = 3.14 \times 225 = 706.5.$$

Radius 15 cm; **diameter** 30 cm; **circumference** 94.2 cm

Problem 15: Bicycle wheel

$$\text{One turn rolls one circumference: } C = 3.14 \times 26 = 81.64 \text{ in.}$$

$$\text{Ten turns: } 81.64 \times 10 = 816.4.$$

816.4 in

Problem 16: Lace trim

$$\text{The edge is the circumference: } C = 2\pi r = 2 \times 3.14 \times 36 = 226.08 \text{ in.}$$

$$\text{Convert to feet: } 226.08 \div 12 = 18.84 \text{ ft.}$$

$$\text{Cost: } 18.84 \times 1.50 = 28.26.$$

226.08 in, or 18.84 ft; the lace costs \$28.26.

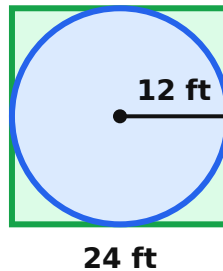
Problem 17: Sprinkler coverage

Square: $24 \times 24 = 576$.

Circle: $3.14 \times 12^2 = 3.14 \times 144 = 452.16$.

Not watered: $576 - 452.16 = 123.84$.

Dry corners: $576 - 452.16 = 123.84$



The corners of the square stay dry.

123.84 ft^2

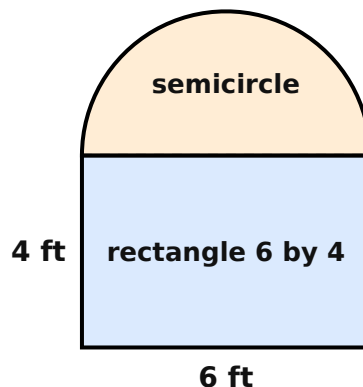
Problem 18: Window with a semicircle

Rectangle: $6 \times 4 = 24$.

The semicircle has diameter 6, so $r = 3$. Half a circle: $\frac{1}{2} \times 3.14 \times 3^2 = \frac{1}{2} \times 28.26 = 14.13$.

Total: $24 + 14.13 = 38.13$.

38.13 ft^2



Solved: rectangle 24 plus semicircle 14.13.

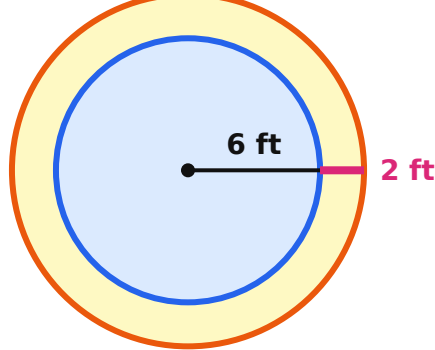
Problem 19: Gravel path

The outer circle has radius $6+2=8$ ft. Its area is $3.14 \times 8^2 = 3.14 \times 64 = 200.96$.

The pond has area $3.14 \times 6^2 = 3.14 \times 36 = 113.04$.

The path is the difference: $200.96 - 113.04 = 87.92$.

$$\text{Path} = 3.14 \times (8 \times 8 - 6 \times 6)$$



Outer circle radius 8 ft, pond radius 6 ft.

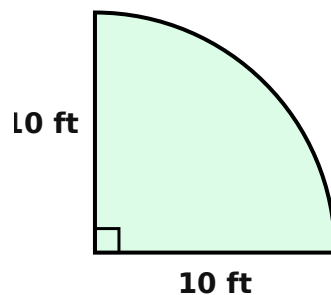
87.92 ft²

Problem 20: Quarter-circle flower bed

(a) The radius is 10. Area: $\frac{1}{4} \times 3.14 \times 10^2 = \frac{1}{4} \times 314 = 78.5$ ft².

(b) Curved edge: $\frac{1}{4} \times 2 \times 3.14 \times 10 = 15.7$. Add the two straight edges: $15.7 + 10 + 10 = 35.7$.

(a) 78.5 ft²; **(b)** 35.7 ft



Solved: curved edge 15.7 ft plus 10 ft plus 10 ft.