

8-1 Circumference

Find the radius or diameter of the circle with the given dimensions.

2. $d = 24$ ft

SOLUTION:

$$r = \frac{d}{2}$$

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

$$r = 12$$

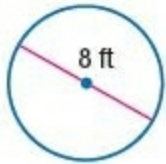
The radius is 12 feet.

ANSWER:

12 ft

Find the circumference of the circle. Use 3.14 or $\frac{22}{7}$ for π . Round to the nearest tenth if necessary.

4.



SOLUTION:

$$C = \pi d$$

$$C \approx 3.14 \cdot 8$$

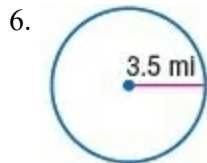
$$C \approx 25.1$$

The circumference of the circle is about 25.1 feet.

ANSWER:

$$3.14 \times 8 = 25.1 \text{ ft}$$

8-1 Circumference



SOLUTION:

$$C = 2\pi r$$

$$C \approx 2 \cdot \frac{22}{7} \cdot 3.5$$

$$C \approx 2 \cdot \frac{22}{7} \cdot 3\frac{1}{2}$$

$$C \approx 2 \cdot \frac{22}{7} \cdot \frac{7}{2}$$

$$C \approx 2 \cdot \frac{\overset{11}{\cancel{22}}}{\underset{1}{\cancel{7}}} \cdot \left(\frac{\overset{1}{\cancel{7}}}{\underset{1}{\cancel{2}}} \right)$$

$$C \approx 22$$

The circumference of the circle is about 22 miles.

ANSWER:

$$\frac{22}{7} \times 7 = 22 \text{ mi}$$

8. The Belknap shield volcano is located in the Cascade Range in Oregon. The volcano is circular and has a diameter of 5 miles. What is the circumference of this volcano to the nearest tenth?

SOLUTION:

$$C = \pi d$$

$$C \approx 3.14 \cdot 5$$

$$C \approx 15.7$$

The circumference of the volcano is about 15.7 miles.

ANSWER:

15.7 mi

8-1 Circumference

Copy and Solve Show your work on a separate piece of paper. Find the diameter given the circumference of the object. Use 3.14 for π .

10. a satellite dish with a circumference of 957.7 meters

SOLUTION:

$$C = \pi d$$

$$957.7 = 3.14d$$

$$\frac{957.7}{3.14} = \frac{3.14d}{3.14}$$

$$305 = d$$

The diameter of the satellite dish is 305 meters.

ANSWER:

305 m

12. a nickel with a circumference of about 65.94 millimeters

SOLUTION:

$$C = \pi d$$

$$65.94 = 3.14d$$

$$\frac{65.94}{3.14} = \frac{3.14d}{3.14}$$

$$21 = d$$

The diameter of the nickel is 21 millimeters.

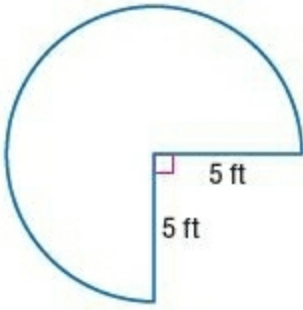
ANSWER:

21 mm

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Find the distance around the figure. Use 3.14 for π .

14.



SOLUTION:

The distance around the figure is $5 + 5$ or 10 feet plus $\frac{3}{4}$ of the circumference of a circle with a radius of 5 feet.

$$C = 2\pi r$$

$$C \approx 2 \cdot 3.14 \cdot 5$$

$$C \approx 31.4$$

So, the distance around the figure is $10 + \frac{3}{4}(31.4)$ or 33.55 feet.

ANSWER:

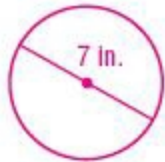
33.55 ft

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16. **Model with Mathematics** Draw and label a circle that has a diameter more than 5 inches, but less than 10 inches. Estimate its circumference and then find its circumference using a calculator. Compare your results.

SOLUTION:

Sample answer:



Estimated circumference:

$$C = \pi d$$

$$C \approx 3 \cdot 7$$

$$C \approx 21$$

The estimated circumference is about 21 inches.

Using calculator:

$$C = \pi d$$

$$C \approx \pi \cdot 7$$

$$C \approx 22$$

The circumference is about 22.0 inches. The estimate is close to the value found on the calculator.

ANSWER:

Sample answer:



Estimated circumference: 21 in.; using calculator: 22.0 in. The estimate is close to the value found on the calculator.

18. **Justify Conclusions** Determine whether the relationship between the circumference of a circle and its diameter is a direct variation. If so, identify the constant of proportionality. Justify your response.

SOLUTION:

Recall that a direct variation relationship is of the form $y = kx$ where k is the constant of proportionality. The formula for the circumference C of a circle related to its diameter is $C = \pi d$. Therefore, the relationship is a direct variation. The two variables C and d have a constant ratio, π . The constant of proportionality is π .

ANSWER:

yes; Sample answer: The formula for the circumference C of a circle related to its diameter is $C = \pi d$. The two variables C and d have a constant ratio, π . The constant of proportionality is π .

8-1 Circumference

Find the radius or diameter of the circle with the given dimension.

20. $d = 30$ m

SOLUTION:

$$r = \frac{d}{2}$$

$$r = \frac{30}{2}$$

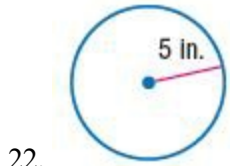
$$r = 15$$

The radius is 15 meters.

ANSWER:

15 m

Find the circumference of the circle. Use 3.14 or $\frac{22}{7}$ for π .



SOLUTION:

$$C = 2\pi r$$

$$C \approx 2 \times 3.14 \times 5$$

$$C \approx 31.4$$

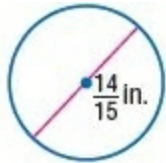
The circumference of the circle is about 31.4 inches.

ANSWER:

$$3.14 \times 2(5) = 31.4 \text{ in.}$$

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24.



SOLUTION:

$$C = \pi d$$

$$C \approx \frac{22}{7} \cdot \frac{14}{15}$$

$$C \approx \frac{22}{\cancel{7}_1} \cdot \frac{\cancel{14}^2}{15}$$

$$C \approx \frac{44}{15} \text{ or } 2\frac{14}{15}$$

The circumference of the circle is about $2\frac{14}{15}$ inches.

ANSWER:

$$\frac{22}{7} \times \frac{14}{15} = 2\frac{14}{15} \text{ in.}$$

26. a dunk tank with a radius of 36 inches

SOLUTION:

$$C = 2\pi r$$

$$C \approx 2(3.14)(36)$$

$$C \approx 226.08$$

The circumference of the circle is about 226.08 inches.

ANSWER:

$$3.14 \times 72 = 226.08 \text{ in.}$$

8-1 Circumference

28. At a local park, Sara can choose between two circular paths to walk. One path has a diameter of 120 yards, and the other has a radius of 45 yards. How much farther can Sara walk on the longer path than the shorter path if she walks around the path once?

SOLUTION:

First find the circumference of the path with a diameter of 120 yards.

$$C = \pi d$$

$$C \approx 3.14 \cdot 120$$

$$C \approx 376.8$$

Next find the circumference of the path with a radius of 45 yards.

$$C = 2\pi r$$

$$C \approx 2 \cdot 3.14 \cdot 45$$

$$C \approx 282.6$$

Sara can walk $376.8 - 282.6$ or about 94.2 yards further on the longer path.

ANSWER:

about 94.2 yd

30. A bicycle tire has a radius of 12.5 inches. Select values to complete the equation below to find the circumference of the wheel. Use 3.14 for π .

$$C \approx \boxed{} \times \boxed{} \times \boxed{}$$

0.5	4
2	12.5
3.14	25

How far does the tire roll in one complete revolution?

SOLUTION:

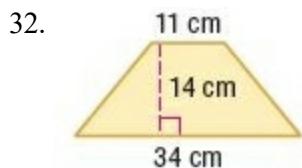
To find the circumference use the formula $C = 2\pi r$. Since the radius is 12.5 the formula is $C \approx 2 \times 12.5 \times 3.14$. One complete revolution of the tire would be the circumference of the tire, so solve the formula for C . The circumference would be 78.5 inches.

ANSWER:

$$C \approx \boxed{2} \times \boxed{12.5} \times \boxed{3.14} ; 78.5 \text{ in.}$$

8-1 Circumference

Find the area of the trapezoid.



SOLUTION:

The bases are 11 centimeters and 34 centimeters. The height is 14 centimeters.

$$A = \frac{1}{2}h(b_1 + b_2)$$

$$A = \frac{1}{2}(14)(11 + 34)$$

$$A = \frac{1}{2}(14)(45)$$

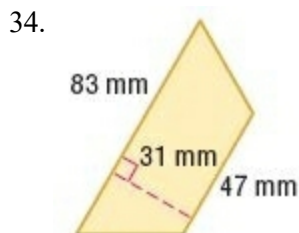
$$A = \frac{1}{2}(630)$$

$$A = 315$$

The area of the trapezoid is 315 square centimeters.

ANSWER:

$$315 \text{ cm}^2$$



SOLUTION:

The bases are 47 millimeters and 83 millimeters. The height is 31 millimeters.

$$A = \frac{1}{2}h(b_1 + b_2)$$

$$A = \frac{1}{2}(31)(47 + 83)$$

$$A = \frac{1}{2}(31)(130)$$

$$A = \frac{1}{2}(4,030)$$

$$A = 2,015$$

The area of the trapezoid is 2,015 square millimeters.

ANSWER:

$$2,015 \text{ mm}^2$$

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36. Find the area of a triangle with a base of 25 inches and a height of 30 inches.

SOLUTION:

$$A = \frac{1}{2}bh$$

$$A = \frac{1}{2} \cdot 25 \cdot 30$$

$$A = \frac{1}{2} \cdot 750$$

$$A = 375$$

The area of the triangle is 375 square inches.

ANSWER:

$$375 \text{ in}^2$$