Diameter or Radius of a Circle Given Circumference

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CONCEPT 1

Diameter or Radius of a Circle Given Circumference

Here you'll find the diameter or radius of a circle given the circumference.

Jillian has done a lot of work to figure out the measurements of the round table where the quilters are working. What about if there was a smaller table?

Jillian's mom brought out a smaller circular table for coffee and tea. The circumference of the table is 12.56 feet. If this is the case, what is the diameter of this circular table?

Can you figure this out? It is a bit like a puzzle.

This Concept will teach you the steps for figuring out problems just like this one.

Guidance

What happens if you are given the circumference but not the radius or the diameter? Can you still solve for one or the other?

Working in this way is a bit tricky and will require us to play detectives once again. You will have to work backwards to figure out the radius and/or the diameter when given only the circumference.

Find the diameter of a circle with a circumference of 21.98 feet.

To work on this problem, we will need our formula for finding the circumference of a circle.

$$C = \pi d$$

Next, we fill in the given information.

$$21.98 = (3.14)d$$

To solve this problem we need to figure out what times 3.14 will give us 21.98. To do this, we divide 21.98 by 3.14.

$$3.14\overline{)21.98}$$

Remember dividing decimals? First, we move the decimal point two places to make our divisor a whole number. Then we can divide as usual.

$$314\overline{)2198}^{\;7}$$

The diameter of this circle is 7 feet.

How could we figure out the radius once we know the diameter?

We can figure out the radius by dividing the diameter in half. The radius is one-half the measure of the diameter.

$7 \div 2 = 3.5$

The radius of the circle is 3.5 feet.

Try a few of these on your own. Figure out the diameter given the circumference of the circle.

Example A

$C = 31.4\ m$

Solution: 10 m

Example B

$C = 28.26\ in$

Solution: 9 inches

Example C

$C = 23.55\ in$

Solution: 7.5 inches

Now back to the original problem.

Jillian has done a lot of work to figure out the measurements of the round table where the quilters are working. What about if there was a smaller table?

Jillian's mom brought out a smaller circular table for coffee and tea. The circumference of the table is 12.56 feet. If this is the case, what is the diameter of this circular table?

Can you figure this out? It is a bit like a puzzle.

To solve this problem, we can use the same steps as we did in the guidance section up above.

To work on this problem, we will need our formula for finding the circumference of a circle.

$$C = \pi d$$

Next, we fill in the given information.

$$12.56 = (3.14)d$$

To solve this problem we need to figure out what times 3.14 will give us 21.98. To do this, we divide 21.98 by 3.14.

$$3.14\overline{)12.56}$$

Remember dividing decimals? First, we move the decimal point two places to make our divisor a whole number. Then we can divide as usual.

$$\begin{array}{r} 4 \\ 314\overline{)2198} \end{array}$$

The diameter of this circle is 4 feet.

Vocabulary

Here are the vocabulary words in this Concept.

Circumference
the measure of the distance around the outside edge of a circle.

Diameter
the measure of the distance across the center of a circle.

Radius
the measure of the distance half-way across the circle. It is the measure from the center to the outer edge. The radius is also half the length of the diameter.

Pi
the ratio of the diameter to the circumference, 3.14

Guided Practice

Here is one for you to try on your own.

What is the radius of a circle with a circumference of 34.54 feet?

Answer

To figure this out, you need to follow the steps that were presented earlier in the Concept.

First, you will need our formula for finding the circumference of a circle.

$$C = \pi d$$

Next, you fill in the given information. Notice that although you want to find the radius, you must start by identifying the diameter.

$$34.54 = (3.14)d$$

To solve this problem we need to figure out what times 3.14 will give us 34.54. To do this, we divide 34.54 by 3.14.

$$3.14\overline{)34.54}$$

Remember dividing decimals? First, we move the decimal point two places to make our divisor a whole number. Then we can divide as usual.

$$\begin{array}{r} 11 \\ 314\overline{)3454} \end{array}$$

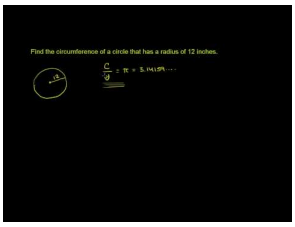
The diameter of this circle is 11 feet.

The radius is half of the diameter.

The radius of this circle is 5.5 feet.

Video Review

Here are videos for review.



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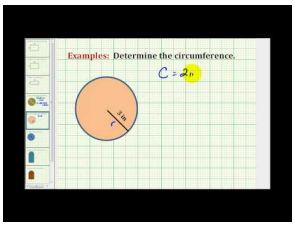
Click image to the left for more content.

KhanAcademy, Circumference of aCircle



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James Sousa,Exampleof Determining the Circumference ofa Circle

Practice

Directions: Find the diameter of each circle given the circumference.

1. C = 37.68 in
2. C = 40.82 in
3. C = 18.84 in
4. C = 28.26 ft.
5. C = 56.52 m
6. C = 17.27 m

7. C = 19.468 ft

8. C = 30.772 ft

Directions: Find the radius of each circle given the circumference.

9. C = 25.2 in

10. C = 37.68 in

11. C = 12.56 in

12. C = 15.7 ft

13. C = 7.85 m

14. C = 15.7 m

15. C = 21.98 m

16. C = 14.13 ft