

Circle Circumference

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CONCEPT

1

Circle Circumference

Here you'll learn to find the circumference of circles given the radius or diameter.

Have you ever had a grandparent visit?



Jillian loves having her grandmother at her house for the summer. About halfway through the visit, Jillian's grandmother receives a phone call from one of her quilting friends. The quilting group that her grandmother is a part of has decided to come for the weekend. Jillian is so excited she can hardly wait.

"My, I hope we have enough room for everyone," Jillian's grandmother tells her after getting the phone call.

"How much room does each person need?" Jillian asks, looking at the round table in the dining room.

"Each quilter needs about 2 feet of space to work, and there are six women coming to visit, plus you and me, that makes eight quilters."

Jillian looks at the table in the dining room again. It is a circle with a diameter of 6 feet across.

How can Jillian figure out if everyone will fit at the table?

Jillian will need to figure out the distance around the table or the circumference of the circle of the table. Then she can figure out if all 8 people will have 2 feet to work.

You will have to figure this out too. In this Concept you will learn all about the circumference of a circle. Pay close attention and then you'll be able to help Jillian with her problem.

Guidance

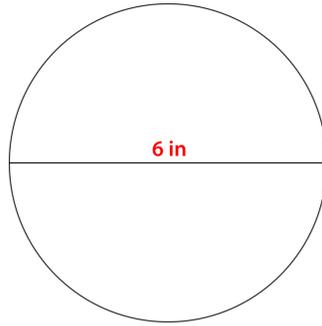
In the last Concept, you learned about the relationship between the diameter and circumference of a circle, so now we can work on figuring out the circumference using a formula and pi.

To figure out the circumference of the circle, we multiply the diameter of the circle times pi or 3.14.

$$C = d\pi$$

Remember, whenever you see the symbol for pi, you substitute 3.14 in when multiplying.

Find the circumference.



The diameter of the circle is 6 inches. We can substitute this given information into our formula and solve for the circumference of the circle.

$$C = d\pi$$

$$C = 6(3.14)$$

$$C = 18.84 \text{ inches}$$

Blast Back in Math

Remember to multiply a decimal and a whole number just as you would with whole numbers and then add the decimal point in **after** multiplying.

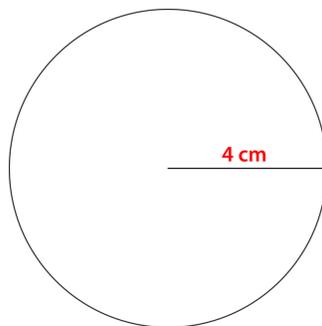


$$\begin{array}{r} 3.14 \\ \times \quad 6 \\ \hline 18.84 \end{array}$$

Our answer is 18.84 inches.

What if we have been given the radius and not the diameter?

Find the circumference.



Remember that the radius is one-half of the diameter. You can solve this problem in two ways.

1. Double the radius right away and then use the formula for diameter to find the circumference. OR
2. Use this formula:

$$C = 2\pi r$$

Let's use the formula to find the circumference of the circle.

$$C = 2(3.14)(4)$$

$$C = 3.14(8)$$

$$C = 25.12 \text{ cm}$$

Our answer is 25.12 cm.

Practice a few of these on your own. Find the circumference given the radius or diameter.

Example A

$$d = 5 \text{ in}$$

Solution: 15.7 inches

Example B

$$r = 3 \text{ in}$$

Solution: 18.84 inches

Example C

$$d = 2.5 \text{ cm}$$

Solution: 7.85 cm

Here is the original problem once again.

Jillian loves having her grandmother at her house for the summer. About halfway through the visit, Jillian's grandmother receives a phone call from one of her quilting friends. The quilting group that her grandmother is a part of has decided to come for the weekend. Jillian is so excited she can hardly wait.

"My, I hope we have enough room for everyone," Jillian's grandmother tells her after getting the phone call.

"How much room does each person need?" Jillian asks, looking at the round table in the dining room.

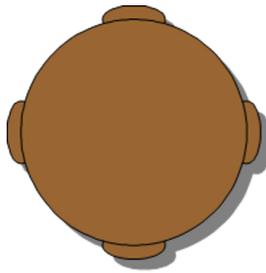
"Each quilter needs about 2 feet of space to work, and there are six women coming to visit, plus you and me, that makes eight quilters."

Jillian looks at the table in the dining room again. It is a circle with a diameter of 6 feet across.

How can Jillian figure out if everyone will fit at the table?

Jillian will need to figure out the distance around the table or the circumference of the circle of the table. Then she can figure out if all 8 people will have 2 feet to work.

First, let's look at a picture of the table in Jillian's house.



Diameter = 6 feet

Next, Jillian needs to find the circumference. Here is the formula we can use to help her out.

$$C = \pi d$$

$$C = (3.14)(6)$$

$$C = 18.84 \text{ feet}$$

Next, Jillian needs to figure out if all eight people will fit given the circumference and the fact that each person needs two feet of space.

If we divide the circumference by the two feet of space, we will know if 8 people can fit around the table.

$$\begin{array}{r} 9.42 \\ 2 \overline{)18.84} \end{array}$$

Given this work, 9 and almost one-half people can fit at the table.

Jillian shows this work to her grandmother, who is very pleased. The entire group can work together and have a little extra space left over.

Vocabulary

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 circumference of a circle with a diameter of 5.5 feet?

Answer

To solve this problem, we first have to figure out the radius of the circle. We can do this by dividing the diameter in half.

$$5.5 \div 2 = 2.75$$

Now we can substitute this value into the formula for circumference.

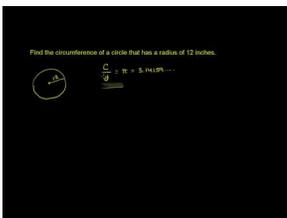
$$C = \pi d$$

$$C = (3.14)(2.75)$$

$$C = 8.635 \text{ feet}$$

We can round to the nearest hundredths place.

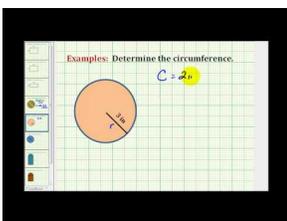
The answer is 8.64 feet.

Video Review

MEDIA

Click image to the left for more content.

[KhanAcademy, Circumference of aCircle](#)



MEDIA

Click image to the left for more content.

[James Sousa,Example of Determining the Circumference of a Circle](#)

Practice

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

1. $d = 5 \text{ in}$
2. $d = 8 \text{ in}$
3. $d = 9 \text{ cm}$
4. $d = 3 \text{ cm}$
5. $d = 10 \text{ ft}$
6. $d = 15 \text{ ft}$

7. $d = 11\ m$

8. $d = 13\ ft$

9. $d = 17\ ft$

10. $d = 20\ in$

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

11. $r = 2.5\ in$

12. $r = 4\ in$

13. $r = 4.5\ cm$

14. $r = 1.5\ cm$

15. $r = 5\ ft$

16. $r = 7.5\ ft$

17. $r = 5.5\ m$

18. $r = 6.5\ ft$

19. $r = 8.5\ ft$

20. $r = 10\ in$