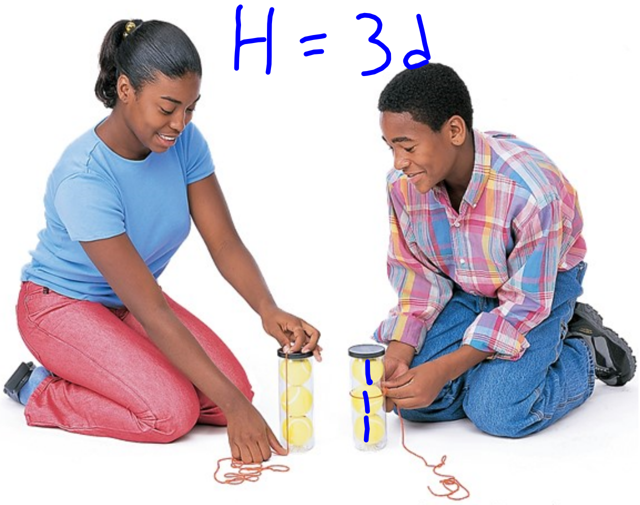
You will need your workbook today!

LESSON 9.5

The Circumference/ Diameter Ratio

$C = \pi d$

$H = 3d$



Launch

Which is greater, the height of a tennis ball can or the circumference of the can?

Describe how you would justify your answer.

LESSON 9.5

The Circumference/ Diameter Ratio

9.5 The Circumference/Diameter Ratio

A. I can use this ratio to solve for unknown values

LESSON 9.5

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Vocabulary

circumference

LESSON 9.5

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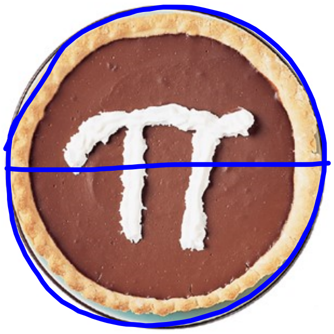

If you actually compared the measurements, you discovered that the circumference of the can is greater than three diameters of the can. In this lesson you are going to discover (or perhaps rediscover) the relationship between the diameter and the circumference of every circle. Once you know this relationship, you can measure a circle's diameter and calculate its circumference.

If you measure the circumference and diameter of a circle and divide the circumference by the diameter, you get a number slightly larger than 3. The more accurate your measurements, the closer your ratio will come to a special number called π (pi), pronounced "pie," like the dessert.

Recall:

Circumference Conjecture

If C is the circumference and d is the diameter of a circle, then there is a number π such that $C = \pi d$. If $d = 2r$ where r is the radius, then $C = 2\pi r$.

LESSON 9.5

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Summarize

- Why would anyone work with π as a symbol rather than immediately approximating it with a decimal?

$21 \cdot 3.14$

$21 \cdot \pi$

$C = 21\pi$

LESSON 9.5

The Circumference/ Diameter Ratio

Summarize

- Why would anyone work with π as a symbol rather than immediately approximating it with a decimal?

Even if the numbers are based on measurements, which are not exact, the result is more exact if π isn't approximated.

LESSON 9.5

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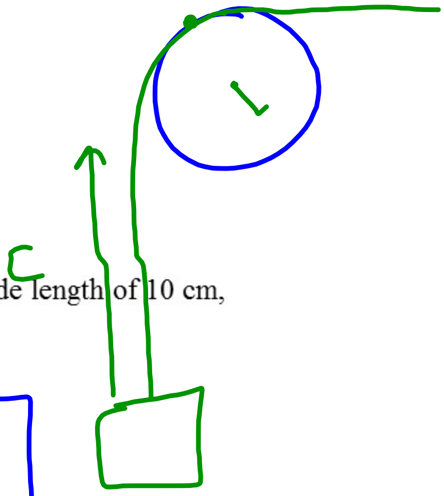
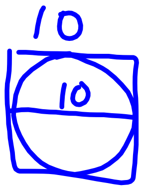
Extra Example



If a circle is inscribed in a square with a side length of 10 cm, what is the circumference of the circle?



10π cm

LESSON 9.5

The Circumference/ Diameter Ratio

Extra Example

ANSWER

If a circle is inscribed in a square with a side length of 10 cm, what is the circumference of the circle?

10π cm

LESSON 9.5

The Circumference/ Diameter Ratio

Closing Question

A circular fountain has a radius of 5 feet.

If the radius is doubled, how does the circumference of the fountain change?

How does the circumference to diameter ratio change? Explain.

LESSON 9.5

The Circumference/ Diameter Ratio

Closing Question

ANSWER

A circular fountain has a radius of 5 feet.

If the radius is doubled, how does the circumference of the fountain change?
Circumference = $2\pi r$, so with a radius of 5 feet the circumference is 10π feet and with a radius of 10 feet the circumference is 20π feet. When the radius doubles, the circumference doubles.

How does the area change?
Area = πr^2, so with a radius of 5 feet the area is 25π square feet and with a radius of 10 feet the area is 100π square feet. When the radius doubles, the area is four times larger.

How does the circumference to diameter ratio change? Explain.
The circumference to diameter ratio is the constant π, so changing the radius does not change the ratio.

Assignment:

Workbook p. 69-70

#s 1-16