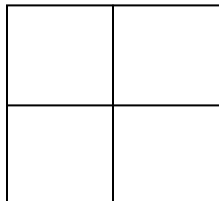


Area of a Circle Connected to the Area of a Square



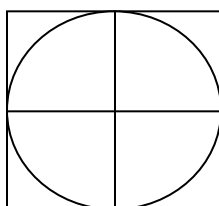
Side length of the little square is 7 cm.

The area of the little square is 49 cm².

The area of the big square is 196 cm².

This can be written as:

$$\text{Area of big square} = (\text{Side length of little square})^2 \times 4$$



The radius of the circle is 7 cm.

The radius squared is 49 cm².

The area of the circle is approximately 153.86 cm².

This can be written as:

$$\text{Area of circle} \approx \text{radius}^2 \times 3.14$$

7. How are the formulas for the area of the circle and the area of the big square similar? How are these formulas different? _____

8. On the other side we found out that the area of a circle is approximately $\frac{3.14}{4}$ of the square in which it fits.

a. Convert $\frac{3.14}{4}$ to a decimal using division. _____

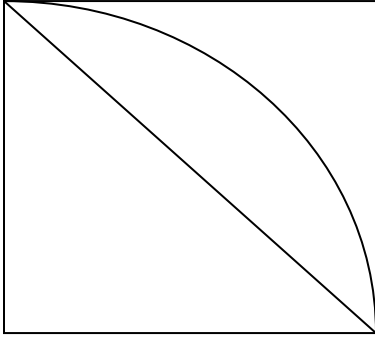
b. Divide the area of the circle above by the area of the big square above. Write your answer in decimal form. _____

c. How did your answers compare in 8a and 8b? Explain why.

$$\text{Area of a Circle} = \pi \cdot \text{radius}^2$$

Area of a Circle Worksheet

ANSWER KEY



- The triangle's area is $\frac{1}{2}$ the area of the square.
- The quarter circle's area is **greater** than the area of the triangle.
- The quarter circle's area is **less** than the area of the square.
- The quarter circle's area is about $\frac{3}{4}$ of the area of the square.

The quarter circle's area is exactly $\frac{3.14}{4}$ of the square!!!!!!

Understanding the Square

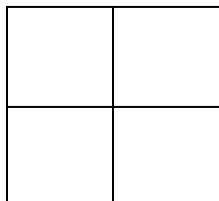
9. If the area of one little square (like the one that each student has and the image shown above) has an area of 20 square units, what is the area of the large square that you started with? Explain why. **The area of the large square will be 80 square units since it takes four small squares to make the large square (4 x 20).**
10. If the area of one little square has an area of 35 square units, what is the area of the large square? Explain why. **The area of the large square will be 140 square units since it takes four small squares to make the large square (4 x 35).**
11. What is the formula for area of a square? **Area = side²**
12. If the side length of one small square is 8 units, what is the area of the large square? Show your thinking below.

Answers will vary.

$$(8 \text{ units} \times 8 \text{ units}) \times 4 = 256 \text{ units}^2$$

13. The side length of the small square is equivalent to the **radius** of the circle.
14. The large circle takes up what fraction of the large square? **$\frac{3.14}{4}$**

Area of a Circle Connected to the Area of a Square



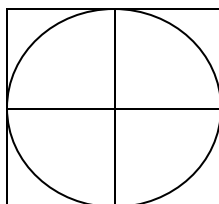
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This can be written as:

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The radius of the circle is 7 cm.

The radius squared is 49 cm².

The area of the circle is approximately 153.86 cm².

This can be written as:

$$\text{Area of circle} \approx \text{radius}^2 \times 3.14$$

15. How are the formulas for the area of the circle and the area of the big square similar? How are these formulas different? **Answers will vary. Both formulas take the distance from the center to the edge and square it. The large square then multiplies it by 4 and the circle multiplies it by 3.14 (pi).**

16. On the other side we found out that the area of a circle is approximately $\frac{3.14}{4}$ of the square in which it fits.

- Convert $\frac{3.14}{4}$ to a decimal using division. **0.785**
- Divide the area of the circle above by the area of the big square above. Write your answer in decimal form. **153.86/196 = 0.785**
- How did your answers compare in 8a and 8b? Explain why. **The answers ended up being the same since the circle is 3.14/4 the size of the big square that it fits perfectly within. This is why the formulas are so similar.**

$$\text{Area of a Circle} = \pi \cdot \text{radius}^2$$