

Fire Pit Homework Worksheet **Answer Key**

Your small engineering firm has been hired to design a fire pit for a client’s new home. The client wants to line the outside of the fire pit with rocks and you need to know how many rocks to purchase in order to complete the job.

1. If you had enough rocks to make a circle with a diameter of 2 feet, what would be the area of the fire pit?

$$\text{radius} = \text{diameter}/2 = 2 \text{ ft}/2 = 1 \text{ ft}$$

$$\text{area} = \pi \times r^2 = \pi \times 1^2 = 3.14 \text{ ft}^2$$

2. If you made a rock circle with a diameter of 4 feet, what would be the area of the fire pit?

$$\text{radius} = \text{diameter}/2 = 4 \text{ ft}/2 = 2 \text{ ft}$$

$$\text{area} = \pi \times r^2 = \pi \times 2^2 = 12.57 \text{ ft}^2$$

3. How does the area of the second fire pit compare to the area of the first fire pit?

$$12.57 \div 3.14 = 4$$

The fire pit with a diameter of 4 ft is four times bigger than the fire pit with a diameter of 2 ft.

4. If you had a fire pit with a diameter of 6 feet, what would be the area of the fire pit?

$$\text{radius} = \text{diameter}/2 = 6 \text{ ft}/2 = 3 \text{ ft}$$

$$\text{area} = \pi \times r^2 = \pi \times 3^2 = 28.27 \text{ ft}^2$$

5. From your results in the questions above, about the three fire pits, what generalizations can you make? Make an *in-out table* to help you answer this question.

Alternate table answer:
Some students may make the “In” column be the radius, which results in finding the same relationship.

In (Diameter)	Out (Area)
2 ft	3.14 ft ²
4 ft	12.57 ft ²
6 ft	28.27 ft ²

When the diameter is doubled, the area goes up by a factor of four. When the diameter is tripled, the area goes up by a factor of nine. The area increases by the square of the factor that the perimeter increases.