UNIT

10

BASIC MATH

10.1 Introduction

Understanding mathematics is the foundation to becoming a successful electrical professional. As you work through this material you will see how easy math is. In this unit you will learn:

- the difference between whole numbers and fractional numbers
- how to convert a percentage into a decimal to use as a multiplier
- the differences between a reciprocal, a square root, and squaring a number

10.12 Surface Area of a Circle

The surface area of a circle is calculated using the formula:

Area of a Circle = $\pi \times r^2$

Use 3.14 for π (pi).

The radius (r^2) is equal to one half the diameter of the circle.

▶ Surface Area—Circle Example 1

Question: *What is the surface area of an 8-in. pizza?* ▶**Figure 10–10**

(a) 25 sq in. (b) 50 sq in. (c) 64 sq in. (d) 75 sq in.

Solution:

Area of a Circle = $\pi \times r^2$

π = 3.14

Radius = ½ the diameter

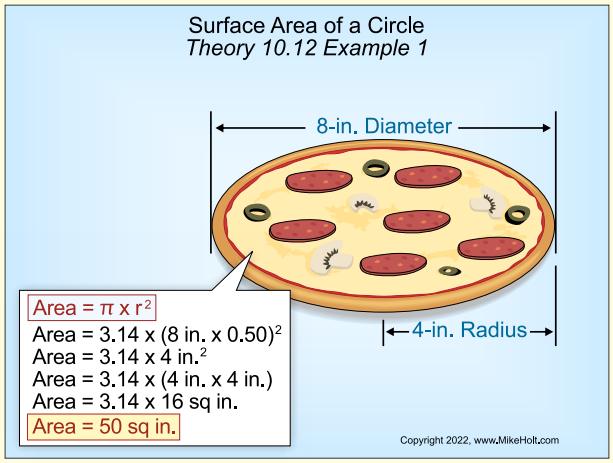
Area = 3.14 × (8 in. × 0.50)^2

Area = 3.14 × 4 in.^{2}

Area = 3.14 × (4 in. × 4 in.)

Area = 3.14 × 16 sq in.

Area = 50 sq in.



▶**Figure 10–10**

Answer: *(b) 50 sq in.*

Note: *If you prefer to use a calculator, then follow these steps:*

Step 1: *Find the radius (½ the diameter) of the circle by multiplying 8 in. by 0.50:*

8 in. × 0.50 = 4 in.

Step 2: *Press the square "x^2" key = 16 sq in.*

Step 3: *Multiply 16 sq in. (Step 2) by 3.14.*

16 sq in. × 3.14 = 50.26 sq in.

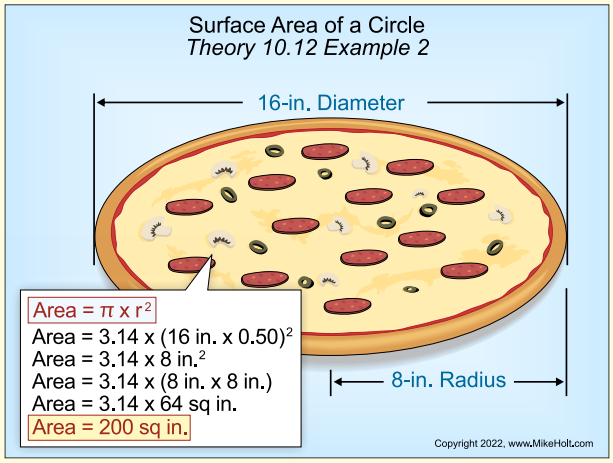
Step 4: *Round to match the answer choices: 50 sq in.*

Answer: *(b) 50 sq in.*

▶ Surface Area—Circle Example 2

Question: *What is the surface area of a 16-in. pizza?* ▶**Figure 10–11**

(a) 100 sq in. (b) 150 sq in. (c) 200 sq in. (d) 256 sq in.



▶**Figure 10–11**

Solution:

Area of a Circle = π × r²

π = 3.14

Radius = ½ the diameter

Area = 3.14 × (16 in. × 0.50)²

Area = 3.14 × 8 in.²

Area = 3.14 × (8 in. × 8 in.)

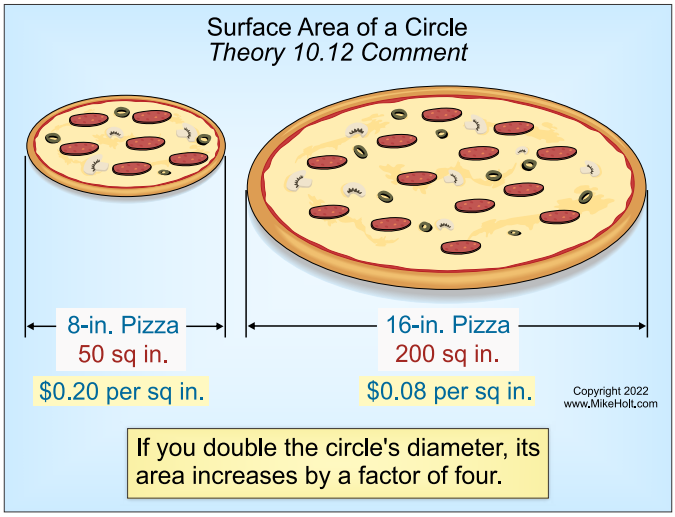
Area = 3.14 × 64 sq in.

Area = 200 sq in.

Answer: *(c) 200 sq in.*

Author's Comment:

- As you can see, if you double the circle's diameter (an 8-in. pizza versus a 16-in. pizza), its area is increased by a factor of four. By the way, a large (or extra-large) pizza is always cheaper per square inch than a small one! ▶**Figure 10–12**



▶**Figure 10–12**