Lesson 5: Calculating the Area of Circles

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| Learning Goals:  |

* To use the formula to calculate area of a circle.
* To calculate area given a diameter
* To calculate area of a semi-circle or quarter circle
* To solve word problems involving area

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| Topic: Calculating Area of Circles |

### **Area of a Circle**

### Area is the space inside an object.

### The units of measure are always squared (i.e. 150 cm2).

### The radius of a circle is the distance from the centre to any point on the circumference of the circle.

**Formula for Area of a Circle**

A = $π$r2

 = 3.14 x (r x r)

\*It is important to square the radius before multiplying by pi\*

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| Example(s):  |

1. Calculate the area of the circle.

r=8cm

**Step 1** Write the required formula.

 A = $π$r2

**Step 2** Substitute the value of the radius into the formula and calculate. Be sure to square the radius before you multiply it by pi.

 A = $π$r2

= 3.14 x (8x8)

 = 3.14 x 64

 = 200.96cm2

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2. Calculate the area of the circle.

d=7cm

**Step 1** Write the required formula.

 A = $π$r2

**Step 2** Substitute the value of the radius into the formula and calculate. Because you are given a diameter of 7cm, you must divide it by 2 to determine the radius (7$÷$2 = 3.5) A = $π$r2

= 3.14 x (3.5x3.5)

 = 3.14 x 12.25

 = 38.465cm2

 = 38.5cm2

 3. Calculate the area of the figure.

**Step 1** We can see this is not a full circle, so we will have to modify the formula. This shape represents ¼ of a circle, so we will divide the total area by 4.

 A = $(π$r2)$÷$4

**Step 2** Substitute the value of the radius into the formula and calculate.

A = $(π$r2)$÷$4

= 3.14 x (5x5)$÷$4

 = 3.14 x 25 $÷$4

 = 19.625cm2

4. A circular display has a radius of 1.7 m. How much plastic is required to cover the display?

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r=1.7m

**Step 1** We are looking for the amount of material to cover the circular display, so, we need to determine the area.

**Step 2** Write the required formula.

 A = $π$r2

**Step 3** Substitute the value of the radius into the formula and calculate.

A = $π$r2

= 3.14 x (1.7x1.7)

 = 3.14 x 2.89

 =9.07m2

**Step 4** Write a final statement.

Approximately 9m² of plastic is needed to cover the display.

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| Practice Questions:  |

1. Calculate the area of each circle to 1 decimal place.

a.

b.



c.



d.

 

e.



2. How much material do you need to cover a circular pool that has a diameter of 6m?

3. You have been asked to paint the surface of your neighbourhood splash pad with a special non-slip paint. The distance from the center of the splash pad to the outside is 5.2m. How much paint do you need?

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| Strand 3 Lesson 5 Assessment |

1. Calculate the area of each circle to one decimal place.

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| r=5mm | d=140.5m |
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2. Ikram is making a circular quilt and has already bought 6m2 of material. She wants her quilt to have a radius of 1.5m. Does she have enough material to make her quilt?