

Important Concepts . . .

Preview Review



Mathematics Grade 7
W3 - Lesson 1: Circles

Important Concepts of Grade 7 Mathematics

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W1 - Lesson 2	Decimal Numbers
W1 - Lesson 3	Fractions
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Materials Required

Math Set
Calculator

**No Textbook
Required**

**This is a stand-
alone course.**

Mathematics Grade 7

Version 6

Preview/Review W3 - Lesson 3

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Preview/Review Concepts for Grade Seven Mathematics



W3 - Lesson 1:

Circles

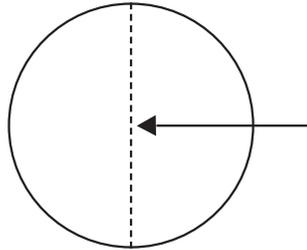
W3 - Lesson 1: Circles

Objective:

- *I can show that the diameter of a circle is twice the radius of a circle.*

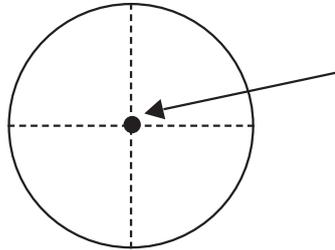
Parts of a Circle

Take a circle and fold it in half. The line segment created by the fold is the diameter of the circle.



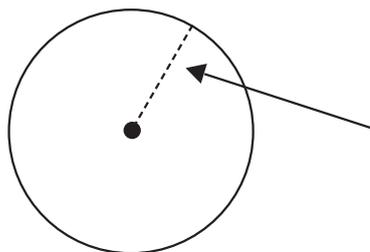
A line segment reaching the edges of a circle and passing through the center is the **diameter**.

Fold the circle in half again. The point where the two line segments cross is the center point of the circle.



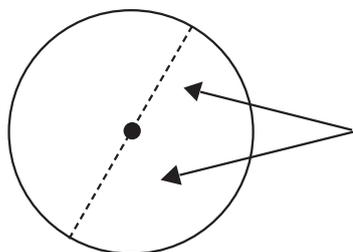
Where two diameters intersect, or cross, is the **center point**.

A line segment from the center point to the edge is the radius.



A line segment from the center point to the edge of the circle is the **radius**.

Put two radii in a straight line and it is the same length as the diameter.



diameter = 2 × radius
or
radius = diameter ÷ 2

Example: A giant Ferris wheel has spokes from the center measuring 20m. How wide across is the Ferris wheel?

The widest point of the wheel is the diameter.

$$\begin{aligned}\text{Diameter} &= 2(\text{radius}) \\ &= 2(20) \\ &= 40\text{m}\end{aligned}$$



Practice:

1. Calculate the radius.

a. Diameter = 42cm

b. Diameter = 12m

c. Diameter = 38mm

d. Diameter = 2 km

2. Calculate the diameter.

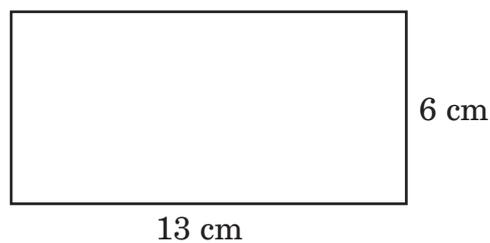
a. Radius = 6cm

b. Radius = 14mm

b. Radius = 2 km

d. Radius = 7m

3. What is the diameter and radius of the largest circle that will fit in the rectangle?

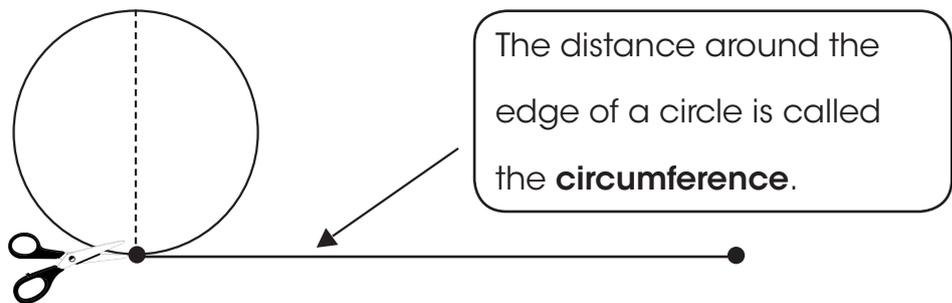


Objective:

- *I can show that the circumference of a circle is approximately three times the diameter.*

Circumference of a circle

Cut a circle and stretch it flat. The resulting line is the circumference of the circle.

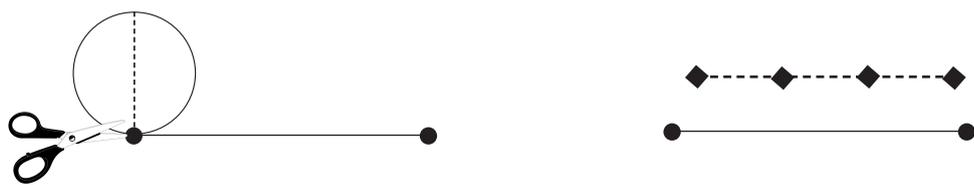


If we compare the length of the diameter to the length of the circumference we'll see it is always about 3 diameter lengths to 1 circumference length.

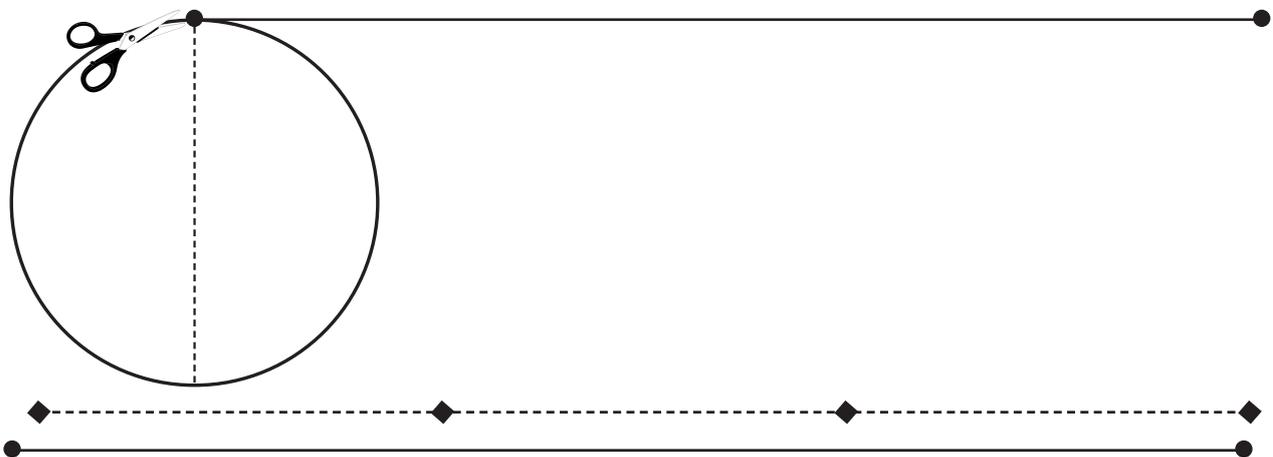


This is true no matter the size of the circles.

It's true for small circles:



It's true for large circles:



Pi (π)

The ratio of circumference to diameter is represented by the Greek letter Pi (π).

π can be used to calculate circumference from the diameter (or diameter from the circumference).

Pi (π) is an irrational number equal to about 3.14

Circumference = $\pi \times$ diameter

Or **$C = \pi d$**

Also: **Diameter = Circumference \div π**

Or **$d = C/\pi$**

Example: The radius of a circle is 6cm, what is the circumference?

$$\begin{aligned} \text{Diameter} &= 2(\text{radius}) \\ &= 2(6) \\ &= 12\text{cm} \end{aligned}$$

$$\begin{aligned} \text{Circumference} &= \pi(\text{diameter}) \\ &= 3.14(12) \\ &= 37.7\text{cm} \end{aligned}$$

Example 2: A piece of candy is stuck on a wheel leaving a sticky spot on the floor whenever it touches. If the sticky spots are about 95 cm apart, what is the diameter of the wheel?

The distance the candy has to go before it touches the ground again is equal to the circumference.

$$\begin{aligned} \text{Diameter} &= \text{Circumference}/\pi \\ &= 95/3.14 \\ &= 30 \text{ cm} \end{aligned}$$

The wheel had a 30cm diameter.



Practice:

1. Calculate circumference if:
 - a. Radius = 3cm
 - b. Radius = 4m
 - c. Diameter = 20mm
 - d. Diameter = 7km

2. Calculate diameter if:
 - a. Circumference = 47cm
 - b. Circumference = 9.5 m
 - c. Circumference = 38 mm
 - d. Circumference = 3 km

3. Calculate radius if:
 - a. Circumference = 69mm
 - b. Circumference = 25 cm
 - c. Circumference = 13km
 - d. Circumference = 31 m

Summary and Practice:

- Using what you've learned, answer the following questions

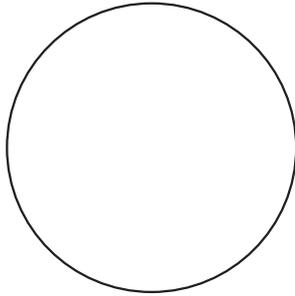
Fill in the blanks.

- The point where two diameters intersect is called the _____.
 - _____ is an irrational number approximately equal to 3.14.
 - _____ = $2(\text{radius})(3.14)$
 - _____ = $\text{diameter} \div 2$
 - _____ = $\text{circumference} \div \pi$
- Complete the chart.

<i>Radius</i>	<i>Diameter</i>	<i>Circumference</i>
4 cm		
	30 m	
		6.28 mm
	12 km	
9 cm		
		314 mm

3. For each circle, measure the diameter, and then calculate the radius and circumference.

a.

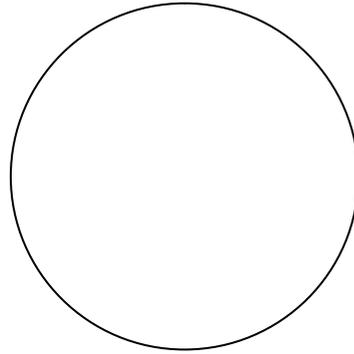


Diameter: _____

Radius: _____

Circumference: _____

b.

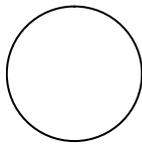


Diameter: _____

Radius: _____

Circumference: _____

c.

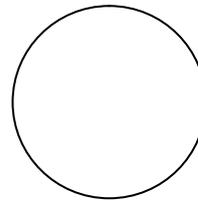


Diameter: _____

Radius: _____

Circumference: _____

d.



Diameter: _____

Radius: _____

Circumference: _____

e.

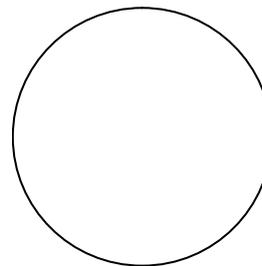


Diameter: _____

Radius: _____

Circumference: _____

f.



Diameter: _____

Radius: _____

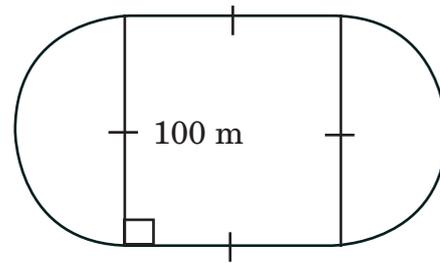
Circumference: _____

4. The diameter of a bike wheel is 45cm. How far will the bike travel if the tires rotate:
- a. Once?

 - b. 5 times?

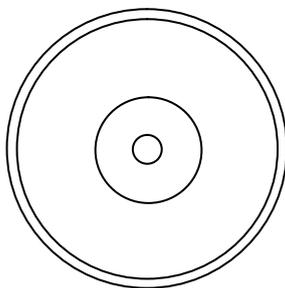
 - c. How many rotations will it take to travel 2km? (1 km = 100 000cm)
5. A bicycle has one gear that has a diameter of 10cm, and a smaller gear with a diameter of 5cm. How much longer is the circumference of the larger gear than the smaller one?

6. What is the total distance of this track?
 Note: The two ends make a circle if put together



7. Hansel and Gretel were walking around a circular forest. Hansel left Gretel to take a path that cut directly through the middle of the forest. If Hansel walked 3 km, how much farther did Gretel have to walk to meet him on the other side?

8. Spencer made a model of the earth for Science. His model started with the inner core with a diameter of 3 cm, the outer core was a layer 4 cm thick, then the mantle which was 8 cm thick, finally the Earth's crust which he made 1 cm thick. What was the final circumference of his model?





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