Year 8 · Geometry: Getting to Know Circles

Name: _____ Date: _____

Hi there! This sheet is all about the special parts of a circle, the radius, the diameter, and the circumference. Take your time, sketch the circles if it helps, and enjoy!

Warm-up

1. What is the name for the distance from the centre of a circle to its edge?

2. What is the name for the distance all the way around a circle?

3. A line goes straight through the centre of a circle and touches opposite edges. What is this line called?

4. A circle has a radius of 5 cm. What is its diameter?

Practice

5. A circle has a diameter of 18 cm. What is its radius?

6. A circle has a radius of 12 mm. What is its diameter?

7. Aroha draws a circle with a diameter of 30 cm. She then draws a radius. How long is the radius?

8. Which part of a circle is longer: the radius or the diameter? Explain why.

9. Tane is decorating a round pizza with a ribbon of chocolate sauce along its circumference. The pizza has a radius of 14 cm. What is the diameter of the pizza?

10. At Avondale Primary, a round trampoline has a diameter of 3.6 m. What is the radius of the trampoline?

Challenge

11. A circular garden pond has a radius of 1.5 m. A path goes straight across the middle of the pond (the diameter), and then Mere walks halfway around the edge from one end of the path to the other. Which is the distance across the pond (the diameter), and by roughly how much would the distance around half the edge be longer? (Use 3 as a rough value for how many diameters fit around a circle.)

12. Two circles are drawn. The smaller circle has a diameter equal to the radius of the larger circle. If the larger circle has a radius of 20 cm, what is the diameter and the radius of the smaller circle?

Answer key (for parents and tutors)

1. What is the name for the distance from the centre of a circle to its edge?
   The radius. It runs from the centre point out to any point on the circle's edge.
2. What is the name for the distance all the way around a circle?
   The circumference. It is the total distance around the outside of the circle.
3. A line goes straight through the centre of a circle and touches opposite edges. What is this line called?
   The diameter. It passes through the centre and joins two opposite points on the edge.
4. A circle has a radius of 5 cm. What is its diameter?
   The diameter is twice the radius. 5 cm × 2 = 10 cm.
5. A circle has a diameter of 18 cm. What is its radius?
   The radius is half the diameter. 18 cm ÷ 2 = 9 cm.
6. A circle has a radius of 12 mm. What is its diameter?
   The diameter is twice the radius. 12 mm × 2 = 24 mm.
7. Aroha draws a circle with a diameter of 30 cm. She then draws a radius. How long is the radius?
   The radius is half the diameter. 30 cm ÷ 2 = 15 cm.
8. Which part of a circle is longer: the radius or the diameter? Explain why.
   The diameter is longer. The diameter goes all the way across through the centre, while the radius only goes from the centre to the edge, half the distance. The diameter is exactly twice the radius.
9. Tane is decorating a round pizza with a ribbon of chocolate sauce along its circumference. The pizza has a radius of 14 cm. What is the diameter of the pizza?
   The diameter is twice the radius. 14 cm × 2 = 28 cm. (The ribbon of sauce follows the circumference, the distance around the pizza.)
10. At Avondale Primary, a round trampoline has a diameter of 3.6 m. What is the radius of the trampoline?
    The radius is half the diameter. 3.6 m ÷ 2 = 1.8 m.
11. A circular garden pond has a radius of 1.5 m. A path goes straight across the middle of the pond (the diameter), and then Mere walks halfway around the edge from one end of the path to the other. Which is the distance across the pond (the diameter), and by roughly how much would the distance around half the edge be longer? (Use 3 as a rough value for how many diameters fit around a circle.)
    First find the diameter: 1.5 m × 2 = 3 m. The full circumference is about 3 × the diameter = 3 × 3 m = 9 m, so halfway around the edge is about 9 m ÷ 2 = 4.5 m. The straight path across is 3 m, so walking around half the edge (4.5 m) is about 4.5 − 3 = 1.5 m longer than walking straight across.
12. Two circles are drawn. The smaller circle has a diameter equal to the radius of the larger circle. If the larger circle has a radius of 20 cm, what is the diameter and the radius of the smaller circle?
    The smaller circle's diameter equals the larger circle's radius, so the smaller diameter = 20 cm. The smaller circle's radius is half of its own diameter: 20 cm ÷ 2 = 10 cm. So the smaller circle has a diameter of 20 cm and a radius of 10 cm.