

Pi Approximation Day puzzles for IGCSE and GCSE

IGCSE Math Revision · IGCSE and GCSE (Higher and Extended) · 22 July · Student sheet

Name _____

Class _____

Date _____

The starter is non-calculator. A calculator is allowed in the main activity.

Starter (5 minutes)

1. Write $22/7$ as a mixed number.
2. Using $\pi = 22/7$, find the circumference of a circle of diameter 21 cm.
3. Using $\pi = 22/7$, find the area of a circle of radius 7 cm.
4. Round 3.142857 to 3 decimal places and to 3 significant figures.

Main activity (30 minutes)

Task A: How good is $22/7$?

Use the π key on your calculator.

- a. Write $22/7$ and π as decimals to 5 decimal places. Which is bigger?
- b. Find the percentage error when $22/7$ is used for π , to 2 significant figures.
- c. A round pond has radius 14 m. Find its area using $22/7$ and using the π key, to 1 decimal place. What is the difference?

Task B: The best fraction

Which fraction with a small denominator is closest to π ?

- a. For denominators 1 to 8, the closest fractions to π are $3/1$, $6/2$, $9/3$, $13/4$, $16/5$, $19/6$, $22/7$ and $25/8$. Which is closest?
- b. Write $355/113$ as a decimal to 7 decimal places. How many decimal places of π does it match?
- c. Find $355/113 - 22/7$ as a single fraction.

Task C: Circle puzzles

Use $\pi = 22/7$.

- a. A wheel has diameter 70 cm. How many complete turns does it make in 1 km?
- b. A semicircle has diameter 28 cm. Find its perimeter.
- c. A circle has circumference 132 cm. Find its radius and its area.

Extension

1. Archimedes showed that π is between $223/71$ and $22/7$. Write both as decimals to 4 decimal places and find the difference between them as a fraction.