

Pi Day maths activities for IGCSE and GCSE

IGCSE Math Revision · IGCSE and GCSE (Higher and Extended) · 14 March · Student sheet

Name _____

Class _____

Date _____

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

Starter (5 minutes)

1. Find the circumference of a circle of diameter 10 cm, in terms of π .
2. Find the area of a circle of radius 4 cm, in terms of π .
3. Write $22/7$ as a decimal to 3 decimal places.
4. Write π correct to 3 significant figures.

Main activity (35 minutes)

Task A: π from a circle and a square

A circle of radius 10 cm is drawn inside a square of side 20 cm. Grains of rice are dropped at random onto the square.

- a. Find the area of the square and of the circle (to 3 significant figures).
- b. What fraction of the square is inside the circle? Give it in terms of π and to 3 significant figures.
- c. 500 grains land on the square and 391 are inside the circle. Find the relative frequency, and use it to estimate π .

Task B: Buffon's needle

Cocktail sticks 5 cm long are dropped onto paper ruled with lines 5 cm apart. The probability that a stick crosses a line is $2/\pi$.

- a. Find the probability to 3 significant figures.
- b. 200 sticks are dropped. How many would you expect to cross a line?
- c. A class drops 200 sticks and 130 cross a line. Use this to estimate π , to 3 significant figures.

Task C: Fractions close to π

Two famous fractions are close to π : $22/7$ and $355/113$.

- a. Write both fractions as decimals to 6 decimal places. Which is closer to $\pi = 3.141593$?
- b. Find the percentage error when $22/7$ is used for π , to 3 significant figures.
- c. A bicycle wheel has diameter 70 cm. Using $\pi = 22/7$, how far does the bicycle travel in 100 turns of the wheel? Give your answer in metres.

Extension

1. $\pi/4 = 1 - 1/3 + 1/5 - 1/7 + 1/9 - \dots$ Use the first 5 terms to estimate π , to 3 significant figures.
2. In the rice experiment, about how many grains would need to land on the square for 1000 to be expected inside the circle?