

Pi Day maths activities for IGCSE and GCSE: answers

IGCSE Math Revision · IGCSE and GCSE (Higher and Extended) · 14 March · Teacher answers and notes

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

Teacher notes

- Pi Day is 14 March because 3/14, written month first, matches $\pi = 3.14\dots$
- Pool the whole class's results in tasks A and B: more trials give a better estimate.
- In task C (b), students often divide by $22/7$ instead of by π : ask what the error is 'a percentage of'.

Starter

1. **10π cm**
 - $\pi \times 10$
2. **16π cm²**
 - $\pi \times 4^2$
3. **3.143**
 - $22 \div 7 = 3.142857\dots$
4. **3.14**
 - $\pi = 3.14159\dots$

Task A: π from a circle and a square

- a. **400 cm² and 314 cm²**
 - $20 \times 20 = 400$
 - $\pi \times 10^2 = 100\pi = 314.15\dots$
- b. **$\pi/4 \approx 0.785$**
 - $100\pi \div 400 = \pi/4 = 0.7853\dots$
- c. **0.782 ; $\pi \approx 3.128$**
 - $391 \div 500 = 0.782$
 - $0.782 \approx \pi/4$, so $\pi \approx 4 \times 0.782 = 3.128$

Task B: Buffon's needle

- a. **0.637**
 - $2 \div \pi = 0.6366\dots$
- b. **127**
 - $200 \times 2/\pi = 127.3\dots$, so about 127.
- c. **3.08**
 - $130/200 \approx 2/\pi$, so $\pi \approx 2 \times 200 \div 130 = 3.076\dots$

Task C: Fractions close to π

a. **3.142857 and 3.141593: 355/113 is closer**

- $22 \div 7 = 3.142857\dots$
- $355 \div 113 = 3.1415929\dots$

b. **0.0402%**

- $(22/7 - \pi) \div \pi \times 100 = 0.04024\dots$

c. **220 m**

- One turn: $22/7 \times 70 = 220$ cm.
- 100 turns: 22 000 cm = 220 m

Extension

1. **3.34**

- $1 - 1/3 + 1/5 - 1/7 + 1/9 = 0.8349\dots$
- $4 \times 0.8349\dots = 3.339\dots$

2. **1273**

- $n \times \pi/4 = 1000$, so $n = 4000/\pi = 1273.2\dots$

Every question is original and every answer was recomputed by computer before publishing.