Diwali maths activities for IB Maths SL and HL: IGCSE / GCSE

IB Math Revision · CBSE Class 9 and Class 10 · Student sheet

Name _____ Class _____ Date _____

No calculator. Every answer works out exactly; use π = 22/7 where a question says so.

Starter (5 minutes)

1. How many lines of symmetry does a regular hexagon have?

2. Find each interior angle of a regular octagon.

3. Find the area of a circle of radius 7 cm. (Use π = 22/7.)

4. Write down the reflection of the point (3, −5) in the *x*-axis.

Main activity (35 minutes)

Task A: A rangoli on a grid

A rangoli is drawn on squared paper with its centre at the origin. Its outline joins A(2, 0), B(0, 2), C(−2, 0) and D(0, −2).

a. Show that ABCD is a square.

b. Find the area of ABCD.

c. A petal of the rangoli has its tip at P(1, 3). The design is symmetric in both axes. Write down the tips of the other three petals, and find the area of the rectangle they form with P.

Task B: A circular rangoli

A circular rangoli of radius 21 cm is divided into 8 equal sectors, coloured alternately. Use $\pi = 22/7$.

a. Find the area of one sector.

b. Find the length of the arc of one sector.

c. The rangoli fits exactly inside a square of side 42 cm. Find the area of the square outside the circle.

Task C: The diya

A diya is modelled as a hemispherical bowl of radius 3.5 cm. Use $\pi = 22/7$.

a. Find the curved outer surface area to be painted.

b. Find the volume of oil the diya holds when full.

c. A cylindrical bottle of oil has radius 3.5 cm and height 12 cm. How many diyas can be filled completely?

Task D: Tiles for a rangoli floor

A tessellation covers a floor with regular polygons, with no gaps or overlaps.

a. Explain why regular pentagons cannot tessellate on their own.

b. Show that two regular octagons and one square fit together exactly at a point.

c. Two copies of a regular n-sided polygon and one equilateral triangle fit exactly at a point. Find n.

Extension

1. A triangular section of a rangoli has sides 13 cm, 14 cm and 15 cm. Find its area.

2. A rangoli outline is a regular polygon with 20 diagonals. How many sides does it have?