Children’s Day maths puzzle challenge for CBSE Class 9 and 10: Class 12

CBSE Math Revision · CBSE Class 12 (no calculator) · 14 November · Student sheet

Name _____ Class _____ Date _____

No calculator. Every answer works out exactly.

Starter (5 minutes)

1. Find $\int_0^1 3x^2\,\mathrm{d}x$.

2. Find the derivative of $x\mathrm{e}^x$ at $x = 0$.

3. Find $(1 + \mathrm{i})(1 - \mathrm{i})$.

4. Find ${}^7\mathrm{C}_3$.

Main activity (30 minutes)

Task A: Round 1: calculus

Children’s Day puzzles for Class 12.

a. Find the area enclosed between $y = x^2$ and $y = 2x$.

b. A rectangular play area has perimeter 20 m. Find the largest possible area.

c. Solve $\mathrm{d}y/\mathrm{d}x = y$ with $y = 3$ when $x = 0$, and find y when $x = \ln 2$.

Task B: Round 2: chance and vectors

More puzzles.

a. A and B are independent, with $P(A) = 1/2$ and $P(B) = 1/3$. Find $P(A \cup B)$.

b. A bag has 4 red and 6 blue balls. Two are drawn without replacement. Find the probability that both are red.

c. $\mathbf{a} = \mathbf{i} + 2\mathbf{j} + 2\mathbf{k}$ and $\mathbf{b} = 2\mathbf{i} + \mathbf{j} - 2\mathbf{k}$. Find $\mathbf{a} \cdot \mathbf{b}$ and the angle between them.

d. Find the area of the parallelogram with sides $\mathbf{a}$ and $\mathbf{b}$.

Extension

1. Find the determinant of the matrix with rows (2, 1) and (3, 4).