Christmas maths escape room for IGCSE and GCSE: SL / AS

IGCSE Math Revision · IB Maths SL and HL (AA and AI) · Student sheet

Name _____ Class _____ Date _____

No GDC needed.

Starter (5 minutes)

1. Evaluate 2^{10}.

2. Evaluate $\log_{10} 1000$.

3. Differentiate $5x^2$.

Main activity (36 minutes)

Cut out the cards. Each code unlocks the next card.

Lock 1: The wrapping room

The first lock shows a logarithm.

a. Solve $\log_2 x = 5$. This is code 1.

Code for lock 1: _____

Lock 2: The list

An arithmetic sequence has $u_1 = 3$ and $d = 4$.

a. Find u_n when n = code 1 ÷ 4. This is code 2.

Code for lock 2: _____

Lock 3: The lights

A string of lights doubles: 1, 2, 4, 8, ...

a. Find the sum of the first n terms, where n = (code 2 + 9) ÷ 4. This is code 3.

Code for lock 3: _____

Lock 4: The power lock

The lock asks for a power of 2.

a. Code $3 + 1 = 2^k$. Find k. This is code 4.

Code for lock 4: _____

Lock 5: The cracker

Inside the cracker is a binomial expansion.

a. Find the coefficient of x^2 in $(1 + x)^n$, where n = code 4. This is code 5.

Code for lock 5: _____

Lock 6: The workshop door

The last lock.

a. $f(x) = x^3$. Find $f'(a)$, where $a > 0$ and a^2 = code 5 − 9. It opens the door.

Code for lock 6: _____

Extension

1. Three presents are opened. Each one, independently, is a book with probability 1/4. Find the probability that at least one is a book.