

Mathematical Reasoning

FOR SELECTIVE SCHOOL TESTS, OPPORTUNITY
CLASS TESTS AND PROBLEM SOLVING

BOOK 3

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First Published 2023

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Dhall, Mohan
Mathematical Reasoning – Book 3

ISBN 978-1-76032-489-6

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Question 1

Half of the people are right a third of the time. There are 168 decisions to be made during the year.

How many decisions do these people get wrong?

- A. 24
- B. 28
- C. 48
- D. 140
- E. 144

Question 2

18 people survived the bridge accident where 162 perished

Which of the following **cannot** be considered a lucky number used by a survivor?

- A. $\frac{1}{18}$
- B. 1
- C. 9
- D. 0.1
- E. 12

Question 3

Of the prime numbers between 10 and 100 what is the difference between those with digits that add to a square number and those with digits that add to a prime number?

- A. 10
- B. 7
- C. 6
- D. 5
- E. 4

Question 4

Which of the following **cannot** be an answer to this this pattern?

$$\begin{aligned}1 + 4 &= 5 \\2 + 5 &= 12 \\3 + 6 &= 21 \\8 + 11 &= ?\end{aligned}$$

- A. 96
- B. 40
- C. 52
- D. 92
- E. 42

Question 5

In a code, 2.10.2 is 2 pm and 1.9.3 is 1 pm.

Which of these is 10 pm?

- A. 5.0.5
- B. 4.6.4
- C. 9.4.9
- D. 8.8.8
- E. 3.7.3

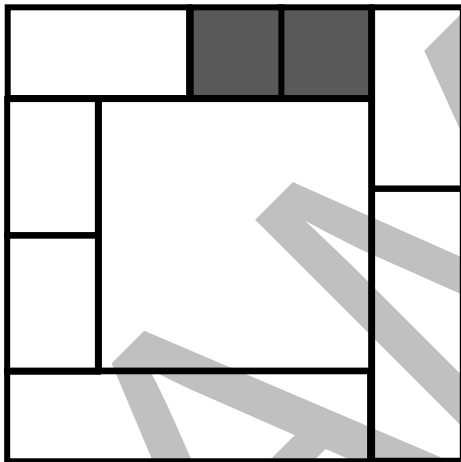
Question 6

An analogue clock gains two hours every one hour of actual time. In a complete 24-hour period how many times will it show the correct time, assuming it is correct at midnight (the start of the day).

- A. 2
- B. 3
- C. 4
- D. 5
- E. 6

Question 7

Look at the figure below.



What proportion of this shape is coloured?

- A. $\frac{1}{15}$
- B. $\frac{2}{25}$
- C. $\frac{1}{18}$
- D. $\frac{1}{12}$
- E. $\frac{1}{16}$

Fully worked solutions

Question 1

D.

$\frac{1}{6}$ of 168 is 28. So, they get 28 decisions correct and 140 incorrect.

Question 2

E.

1 of the 18 survivors, 1 of the survivors, $9 = 1 + 8$, $0.1 = 18 \div 180$ the number of passengers, $12 = 1 \times 6 \times 2 =$ (the sum of the digits of the number who perished).

Question 3

C.

Sum of the digits of prime numbers between 10 and 100:

11: 2 (prime)
 13: 4 (square)
 17: 8 (cube)
 19: 10
 23: 5 (prime)
 29: 11 (prime)
 31: 4 (square)
 37: 10
 41: 5 (prime)
 43: 7 (prime)
 47: 11 (prime)
 53: 8 (cube)
 59: 14
 61: 7 (prime)
 67: 13 (prime)
 71: 8 (cube)
 73: 10
 79: 16 (square)
 83: 11 (prime)
 89: 17 (prime)
 97: 16 (square)

There are 10 that have digits that add to a prime number and 4 that have digits that add to a square. The difference is 6.