2.33-3 Problem Solving and Logic Set C: 30-minute Pack

GL ASSESSMENT GL · Calculators not allowed · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 The nth term of a sequence is given by 3n + 2. What is the sum of the 4th term and the 10th term?

(3)

---

2 A car travels at a constant speed of 60 km/h. How many minutes does it take to travel 45 km?

(2)

---

3 A bag contains 4 red counters, 3 blue counters and 5 green counters, and nothing else. One counter is taken out at random. What is the probability that it is NOT blue?

- ☐ A) 3/12
- ☐ B) 9/12
- ☐ C) 4/12
- ☐ D) 5/12

© Revision Library | revisionlibrary.co.uk

4 Four houses stand in a row, numbered 1 to 4 from left to right. Each house is a different colour: red, blue, green or yellow.

- The blue house is somewhere to the left of the yellow house.
- The green house is next to the red house.
- House 1 is not red and not blue.
- House 4 is yellow.

Work out the colour of each house.

(4)

---

5 Priya has 3 £1 coins and 4 50p coins. How much money does she have in total? Give your answer in pounds.

(2)

---

6 Five children - Aisha, Ben, Chloe, Dev and Freya - take part in a running race. There are no ties.

- Chloe finished immediately before Dev.
- Aisha finished before Ben but after Freya.
- Dev did not finish first.
- Ben finished third.

Work out the finishing order, from 1st to 5th.

(4)

© Revision Library | revisionlibrary.co.uk

7 In a number pyramid, each block is found by adding together the two blocks directly below it.
The bottom row (left to right) is: 5, x, 9, 4
The top block of the pyramid is 54.
Find the value of x.

(4)

---

8 A fruit salad recipe uses apples, grapes and strawberries in the ratio 3:4:5. A large batch is made using 600 g of strawberries. 15% of the total mass of fruit salad is then removed to make a smaller portion for a child. What mass of fruit salad, in grams, remains after the child's portion is removed?

(5)

---

9 Look at the sequence: 2, 5, 8, 11, 14, ...
What is the 8th term of this sequence?

(2)

© Revision Library | revisionlibrary.co.uk

10 Which number continues the sequence?
1, 4, 9, 16, 25, ...

- ☐ A) 30
- ☐ B) 36
- ☐ C) 32
- ☐ D) 28

---

11 A piggy bank contains only 20p and 10p coins. There are 15 coins in total, worth £2.20. How many 20p coins are there?

(3)

© Revision Library | revisionlibrary.co.uk

Mark scheme · 2.33-3 Problem Solving and Logic Set C: 30-minute Pack

Question 1

4th term = 3(4) + 2 = 14	**M1**
10th term = 3(10) + 2 = 32	**M1**
46 cao	**A1**

Answer: 46

Question 2

time = 45 / 60 hours oe	**M1**
45 minutes cao	**A1**

Answer: 45 minutes

Question 3

total counters = 12 and not-blue counters = 12 - 3 = 9	**M1**
B (9/12) cao, accept equivalent fraction 3/4	**A1**

Answer: B) 9/12 (= 3/4)

Question 4

House 1 - green cao (deduced from clue 3, since house 4 is already yellow)	**B1**
House 2 - red cao (deduced, green must be next to red)	**B1**
House 3 - blue cao (remaining colour, consistent with blue left of yellow)	**B1**
House 4 - yellow cao (given)	**B1**

Answer: House 1 - green, House 2 - red, House 3 - blue, House 4 - yellow

Question 5

3 x 1 + 4 x 0.5 oe	**M1**
£5 cao	**A1**

Answer: £5

Question 6

deduces Freya and Aisha must occupy positions 1 and 2, since both finish before Ben in 3rd, with Freya before Aisha	**M1**
Freya - 1st and Aisha - 2nd cao	**B1**
Chloe - 4th and Dev - 5th cao, from the adjacency clue applied to the two remaining positions	**B1**
complete correct order: Freya, Aisha, Ben, Chloe, Dev	**A1**

Answer: 1st Freya, 2nd Aisha, 3rd Ben, 4th Chloe, 5th Dev

Question 7

finds the second row in terms of x: (5 + x), (x + 9), 13	**M1**
finds the third row in terms of x: (2x + 14), (x + 22)	**M1**
forms and simplifies the top-block equation: (2x + 14) + (x + 22) = 54, i.e. 3x + 36 = 54	**dM1**
6 cao	**A1**

Answer: 6

Question 8

total ratio parts = 3 + 4 + 5 = 12	**B1**
value of 1 part = 600 / 5 = 120 g	**M1**
total mass of batch = 12 x 120 = 1440 g	**M1**
mass removed = 0.15 x 1440 = 216 g (or works with 85% directly)	**M1**
1224 g cao	**A1**

Answer: 1224 g

Question 9

identifies the common difference of 3 and extends the sequence, or uses 3n - 1 oe	**M1**
23 cao	**A1**

Answer: 23

Question 10

B (36) cao	**B1**

Answer: B) 36

Question 11

sets up x + y = 15 and 20x + 10y = 220 oe	**M1**
correct elimination step, e.g. 2x + y = 22, so x = 7 oe	**M1**
7 cao	**A1**

Answer: 7

© Revision Library | revisionlibrary.co.uk