



EP.M113 Missing Digit and Calculation Puzzles

GL ASSESSMENT GL-11PLUS-MATHS · Calculators not allowed · about 55 minutes

Total Marks

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Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

- 1** In the addition below the blank stands for one digit. $4_6 + 289 = 715$. What is the missing digit?

- ☐ A) 1
- ☐ B) 2
- ☐ C) 3
- ☐ D) 4
- ☐ E) 5

(Total for Question 1 is 1 mark)

- 2** In this subtraction the blank is a single digit. $89_ - 457 = 433$. Which digit replaces the blank?

- ☐ A) 8
- ☐ B) 1
- ☐ C) 0
- ☐ D) 9
- ☐ E) 7

(Total for Question 2 is 1 mark)

- 3** Find the missing digit: $65 \times _ = 455$

- ☐ A) 6
- ☐ B) 5
- ☐ C) 8
- ☐ D) 7
- ☐ E) 9

(Total for Question 3 is 1 mark)

4 The blank is a single digit: $_8 \div 4 = 22$. What is the blank?

- ☐ A) 6
- ☐ B) 4
- ☐ C) 7
- ☐ D) 8
- ☐ E) 2

(Total for Question 4 is 1 mark)

5 In the addition below the blank is a single digit. $3_8 + 267 = 615$. Find the blank.

- ☐ A) 1
- ☐ B) 3
- ☐ C) 4
- ☐ D) 2
- ☐ E) 5

(Total for Question 5 is 1 mark)

6 Find the missing digit in the subtraction: $6_2 - 175 = 487$

- ☐ A) 5
- ☐ B) 8
- ☐ C) 6
- ☐ D) 4
- ☐ E) 7

(Total for Question 6 is 1 mark)

7 Each symbol # stands for the same single digit. $\#7 + 35 = 102$. What digit does # represent?

- ☐ A) 5
- ☐ B) 6
- ☐ C) 7
- ☐ D) 4
- ☐ E) 3

(Total for Question 7 is 1 mark)

8 Each symbol # stands for the same single digit. $\#5 + 48 = 123$. What digit does # represent?

- ☐ A) 6
- ☐ B) 5
- ☐ C) 7
- ☐ D) 4
- ☐ E) 8

(Total for Question 8 is 1 mark)

9 In the calculation below a blank is one digit. $4_ \times 12 = 528$. Find the missing digit.

- ☐ A) 3
- ☐ B) 4
- ☐ C) 5
- ☐ D) 2
- ☐ E) 6

(Total for Question 9 is 1 mark)

10 Which digit replaces the blank? $11_ + 289 = 400$

- ☐ A) 0
- ☐ B) 1
- ☐ C) 2
- ☐ D) 3
- ☐ E) 4

(Total for Question 10 is 1 mark)

11 Find the digit in the blank: $7_9 - 341 = 438$

- ☐ A) 5
- ☐ B) 6
- ☐ C) 7
- ☐ D) 8
- ☐ E) 9

(Total for Question 11 is 1 mark)

12 In the addition below the blank is a digit. $_56 + 237 = 893$. What is the blank?

- ☐ A) 4
- ☐ B) 6
- ☐ C) 7
- ☐ D) 5
- ☐ E) 8

(Total for Question 12 is 1 mark)

13 In the multiplication below a blank stands for a digit. $2_3 \times 4 = 892$. Find the missing digit and show the method.

(Total for Question 13 is 2 marks)

14 A three-digit number written as $_52$ minus 379 equals 173. Find the missing digit and show your working.

(Total for Question 14 is 2 marks)

15 Each digit d is the same in both places. $d5 + 5d = 121$. Find d . Show the steps.

(Total for Question 15 is 3 marks)

16 Find the missing digit in the subtraction $9_5 - 218 = 777$. Show your working.

(Total for Question 16 is 3 marks)

- 17** A two-digit number less than 70, multiplied by 3, gives 2_1. Find the blank and show your method.

(Total for Question 17 is 3 marks)

- 18** A three-digit number 1_2 when divided by 24 leaves remainder 6. Find the missing digit. Show how you decided.

(Total for Question 18 is 3 marks)

- 19** In the addition below a digit is blank: $_47 + 538 = 985$. Find the missing digit and show your steps.

(Total for Question 19 is 4 marks)

20 Multi-part column puzzle. Use exact arithmetic and show steps in each part.

(a) Write the missing digit in the three-digit number $_23$ so that $_23 + 479 = 802$. (2)

.....
(b) Multiply the three-digit number you found in part (a) by 4. Write the product. (3)

.....
(c) In the product from part (b) the tens-hundreds place is shown as 1_92 . Write the missing digit. (3)

(Total for Question 20 is 8 marks)

Mark scheme · EP.M113 Missing Digit and Calculation Puzzles

Question 1

- **B1** correct option B (2) cao
- **Answer: B) 2** (because $426 + 289 = 715$).

Question 2

- **B1** correct option C (0) cao
- **Answer: C) 0** (because $890 - 457 = 433$).

Question 3

- **B1** correct option D (7) cao
- **Answer: D) 7** (since $65 \times 7 = 455$).

Question 4

- **B1** correct option D (8) cao
- **Answer: D) 8** ($88 \div 4 = 22$).

Question 5

- **B1** correct option C (4) cao
- **Answer: C) 4** ($348 + 267 = 615$).

Question 6

- **B1** correct option C (6) cao
- **Answer: C) 6** ($662 - 175 = 487$).

Question 7

- **B1** correct option B (6) cao
- **Answer: B) 6** ($67 + 35 = 102$).

Question 8

- **B1** correct option C (7) cao
- **Answer: C) 7** ($75 + 48 = 123$).

Question 9

- **B1** correct option B (4) cao
- **Answer: B) 4** ($44 \times 12 = 528$).

Question 10

- **B1** correct option B (1) cao
- **Answer: B) 1** ($111 + 289 = 400$).

Question 11

- **B1** correct option C (7) cao
- **Answer: C) 7** ($779 - 341 = 438$).

Question 12

- **B1** correct option B (6) cao
- **Answer: B) 6** ($656 + 237 = 893$).

Question 13

- **M1** division or equivalent method: $892 \div 4 (= 223)$ seen
- **A1** missing digit 2 in 2_3 (223) cao
- **Answer: Missing digit = 2** ($223 \times 4 = 892$).

Question 14

- **M1** add $379 + 173 (= 552)$ or equivalent method seen
- **A1** hundreds digit 5 (552) cao
- **Answer: 5 (the number is 552).**

Question 15

- **M1** form equation: $(10d + 5) + (50 + d) = 121$ seen
- **M1** simplify to $11d + 55 = 121$ and $11d = 66$ seen
- **A1** $d = 6$ cao
- **Answer: $d = 6$ (since $65 + 56 = 121$).**

Question 16

- **M1** add $218 + 777 (= 995)$ or equivalent method seen
- **M1** write result 995 or show hundreds, tens and units correctly
- **A1** missing digit 9 cao
- **Answer: 9 (because $995 - 218 = 777$).**

Question 17

- **M1** divide 2_1 by 3 or show $3 \times ? = 201$ seen
- **M1** correct quotient 67 or equivalent calculation seen
- **A1** blank = 0 cao
- **Answer: 0 (because $67 \times 3 = 201$).**

Question 18

- **M1** recognise equation $1_2 = 6 \pmod{24}$ or show trial with possible digits
- **M1** show candidate 102 and compute $102 \div 24$ remainder (= 6) or equivalent
- **A1** blank = 0 cao
- **Answer: 0 ($102 \div 24$ leaves remainder 6).**

Question 19

- **M1** set up subtraction $985 - 538$ or equivalent method seen
- **M1** compute subtraction (= 447) seen
- **M1** identify hundreds digit 4 or show the filled number 447
- **A1** blank = 4 cao
- **Answer: 4 ($447 + 538 = 985$).**

Question 20

- (a) **M1** set up subtraction $802 - 479 (= 323)$ or equivalent
- (a) **A1** hundreds digit 3 cao
- (a) **Answer: 3**
- (b) **M1** correct method for multiplication seen (323×4)
- (b) **M1** intermediate partial product correct or $323 \times 2 = 646$ seen
- (b) **A1** final product 1292 cao
- (b) **Answer: 1292**
- (c) **M1** recognise product 1292 from part (b) or recalc 1292
- (c) **M1** identify the blank (the hundreds digit) correctly
- (c) **A1** blank = 2 cao
- (c) **Answer: 2**