2.25 Number and Place Value Challenge: Test Pack

GL ASSESSMENT EP.M25 · Calculators not allowed · about 35 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

Number and Place Value Challenge

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A scholarship-level number skills paper for 11+ preparation. It covers place value into the millions and decimals, negative numbers, rounding and estimation, factors, multiples and primes, powers and roots, and the correct order of operations. Questions are ramped from warm-up recall items to demanding multi-step problems designed to stretch the strongest candidates.

1 Work out $3^2 + 2^3$.

- ☐ A) 12
- ☐ B) 17
- ☐ C) 25
- ☐ D) 72
- ☐ E) 19

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2 Using each of the digit cards 3, 5, 6, 9, 7 once, what is the largest even 5-digit number that can be made?

- ☐ A) 97,536
- ☐ B) 97,653
- ☐ C) 35,679
- ☐ D) 97,537
- ☐ E) 97,356

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3 Using each of the digit cards 1, 7, 2, 5, 8 once, what is the largest even 5-digit number that can be made?

- [ ] A) 87,521
- [ ] B) 87,512
- [ ] C) 12,578
- [ ] D) 87,511
- [ ] E) 87,513

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4 Using each of the digit cards 2, 6, 7, 3 once, what is the difference between the largest and smallest 4-digit numbers that can be made?

- [ ] A) 9,999
- [ ] B) 7,632
- [ ] C) 5,256
- [ ] D) 5,264
- [ ] E) 5,265

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5 Using each of the digit cards 0, 5, 2, 9 once, what is the difference between the largest and smallest 4-digit numbers that can be made?

- [ ] A) 7,462
- [ ] B) 7,452
- [ ] C) 7,461
- [ ] D) 11,579
- [ ] E) 9,261

---

6 Using each of the digit cards 7, 8, 3, 4 once, what is the difference between the largest and smallest 4-digit numbers that can be made?

- [ ] A) 12,221
- [ ] B) 5,266
- [ ] C) 5,265
- [ ] D) 8,743
- [ ] E) 5,256

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7 Using each of the digit cards 6, 7, 0, 5 once, what is the difference between the largest and smallest 4-digit numbers that can be made?

- ☐ A) 2,574
- ☐ B) 7,083
- ☐ C) 2,582
- ☐ D) 2,583
- ☐ E) 12,717

---

8 Order these numbers from smallest to largest: -8, 3, -2, 0, -11

(1)

---

9 Using each of the digit cards 9, 4, 7, 2 once, what is the smallest odd 4-digit number that can be made?

- ☐ A) 2,480
- ☐ B) 9,742
- ☐ C) 2,497
- ☐ D) 2,479
- ☐ E) 2,478

---

10 A submarine is at a depth of 245 m below sea level. It then rises 180 m. What is its new depth, relative to sea level?

- ☐ A) 425 m below sea level
- ☐ B) 65 m below sea level
- ☐ C) 65 m above sea level
- ☐ D) 425 m above sea level
- ☐ E) 25 m below sea level

---

11 A parcel weighs 7.5482 kg. Round this weight to:

(a) 1 decimal place. **(1)**

(b) 2 decimal places. **(1)**

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12 Express 360 as a product of its prime factors.

(2)

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13 Write 3.4 million in figures.

(1)

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14 Work out (-6) x 4 + (-3) x (-5).

(2)

---

15 Using each of the digit cards 7, 6, 3, 9 once, what is the difference between the largest and smallest 4-digit numbers that can be made?

- ☐ A) 6,084
- ☐ B) 13,442
- ☐ C) 6,075
- ☐ D) 6,083
- ☐ E) 9,763

---

16 Using each of the digit cards 0, 1, 7, 3 once, what is the difference between the largest and smallest 4-digit numbers that can be made?

- ☐ A) 6,273
- ☐ B) 7,173
- ☐ C) 8,347
- ☐ D) 6,264
- ☐ E) 6,272

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17 Using each of the digit cards 3, 2, 7, 8 once, what is the smallest odd 4-digit number that can be made?

- ☐ A) 2,387
- ☐ B) 2,388
- ☐ C) 2,378
- ☐ D) 2,386
- ☐ E) 8,732

---

18 Using each of the digit cards 3, 2, 5, 1 once, what is the largest even 4-digit number that can be made?

- ☐ A) 5,311
- ☐ B) 5,313
- ☐ C) 1,235
- ☐ D) 5,321
- ☐ E) 5,312

---

19 Find the Lowest Common Multiple (LCM) of 8 and 12.

(2)

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20 Using each of the digit cards 4, 3, 9, 2 once, what is the smallest odd 4-digit number that can be made?

- ☐ A) 2,439
- ☐ B) 9,432
- ☐ C) 2,348
- ☐ D) 2,350
- ☐ E) 2,349

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21 The temperature at midnight was -6C. By 9am it had risen by 10C. What was the temperature at 9am?

- ☐ A) -16C
- ☐ B) -4C
- ☐ C) 4C
- ☐ D) 16C
- ☐ E) 6C

---

22 Work out $\sqrt[3]{125} + \sqrt{49}$.

(1)

---

23 Work out $(-4)^2 - (-3)^3$.

(2)

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24 $60 = 2^2 \times 3 \times 5$ and $84 = 2^2 \times 3 \times 7$ are written as products of prime factors.

(a) Use these to find the highest common factor (HCF) of 60 and 84. **(1)**

.....

(b) Use these to find the lowest common multiple (LCM) of 60 and 84. **(2)**

.....

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25 Put one pair of brackets into the left-hand side of $3 + 4 \times 5 - 2 = 33$ to make the statement correct.

(2)

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26 By rounding each number to 1 significant figure, estimate the value of (7.8 x 4.1) / 0.52.

(3)

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27 Find the smallest positive whole number by which 180 must be multiplied to give a square number.

(3)

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Mark scheme · 2.25 Number and Place Value Challenge: Test Pack

A correct answer earns full marks unless the question asks for working, a method, proof or explanation.

Question 1

B (17) cao **B1**

Answer: B) 17

Question 2

correct option A (97,536) cao **B1**

Answer: A) 97,536

Question 3

correct option B (87,512) cao **B1**

Answer: B) 87,512

Question 4

correct option E (5,265) cao **B1**

Answer: E) 5,265

Question 5

correct option C (7,461) cao **B1**

Answer: C) 7,461

Question 6

correct option C (5,265) cao **B1**

Answer: C) 5,265

Question 7

correct option D (2,583) cao **B1**

Answer: D) 2,583

Question 8

-11, -8, -2, 0, 3 cao **B1**

Answer: -11, -8, -2, 0, 3

Question 9

correct option D (2,479) cao **B1**

Answer: D) 2,479

Question 10

B (65 m below sea level) cao **B1**

Answer: B) 65 m below sea level

Question 11

(a) 7.5 cao **B1**

(a) Answer: 7.5 kg

(b) 7.55 cao **B1**

(b) Answer: 7.55 kg

Question 12

shows a correct factor tree or division ladder with at least three correct prime factors identified oe **M1**

$2^3 \times 3^2 \times 5$ cao (accept 2 x 2 x 2 x 3 x 3 x 5) **A1**

Answer: $2^3 \times 3^2 \times 5$ (= 2 x 2 x 2 x 3 x 3 x 5)

Question 13

3,400,000 cao **B1**

Answer: 3,400,000

Question 14

evaluates both products, -24 and +15 (or 15 shown), oe **M1**

-9 cao **A1**

Answer: -9

Question 15

correct option A (6,084) cao **B1**

Answer: A) 6,084

Question 16

correct option A (6,273) cao **B1**

Answer: A) 6,273

Question 17

correct option A (2,387) cao **B1**

Answer: A) 2,387

Question 18

correct option E (5,312) cao **B1**

Answer: E) 5,312

Question 19

writes 8 and 12 as products of prime factors ($8 = 2^3$, $12 = 2^2 \times 3$) or lists multiples of each oe **M1**

24 cao **A1**

Answer: 24

Question 20

correct option E (2,349) cao **B1**

Answer: E) 2,349

Question 21

C (4C) cao **B1**

Answer: C) 4C

Question 22

12 cao **B1**

Answer: 12

Question 23

correctly evaluates both powers, $(-4)^2 = 16$ and $(-3)^3 = -27$, with correct signs oe **M1**

43 cao **A1**

Answer: 43

Question 24

(a) 12 cao **B1**

(a) Answer: 12

(b) $2^2 \times 3 \times 5 \times 7$ oe (each prime at its highest power), or 60 x 7, or 84 x 5 **M1**

(b) 420 cao **A1**

(b) Answer: 420

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Question 25

tests a bracketed version, e.g. (3 + 4) x 5 = 35 seen, or 3 + 4 x 5 - 2 = 21 without brackets seen	**M1**
(3 + 4) x 5 - 2 = 33 cao	**A1**

Answer: (3 + 4) x 5 - 2 = 33

Question 26

rounds to 8, 4 and 0.5 (all three correct)	**M1**
(8 x 4) / 0.5 or 32 / 0.5 seen, ft from rounded values	**M1**
64 cao	**A1**

Answer: 64

Question 27

writes 180 as 2^2 x 3^2 x 5 (or 2 x 2 x 3 x 3 x 5), oe	**M1**
identifies that only the 5 is not part of a pair of equal prime factors, oe	**M1**
5 cao	**A1**

Answer: 5

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