2.87 Divisibility Rules and Number Property Puzzles: Test Pack

Total Marks

GL ASSESSMENT GL-11PLUS-MATHS · Calculators not allowed · about 45 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Which of these numbers is divisible by 3?

- ☐ A) 248
- ☐ B) 249
- ☐ C) 350
- ☐ D) 253
- ☐ E) 257

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2 The number 342*5 is divisible by 9, where * stands for one digit. What is the digit?

- ☐ A) 1
- ☐ B) 2
- ☐ C) 9
- ☐ D) 4
- ☐ E) 3

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3 The number 76*3 is divisible by 9, where * stands for one digit. What is the digit?

- ☐ A) 0
- ☐ B) 1
- ☐ C) 2
- ☐ D) 3
- ☐ E) 5

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4 Which of these numbers is divisible by 18?

- ☐ A) 404
- ☐ B) 1080
- ☐ C) 873
- ☐ D) 153
- ☐ E) 370

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5 Which of these numbers is divisible by 6?

- ☐ A) 90
- ☐ B) 477
- ☐ C) 982
- ☐ D) 333
- ☐ E) 626

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6 A four-digit number has digits 2, 3, 1 and d. The number is divisible by 9. Find d.

(1)

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7 The number 2*319 is divisible by 9, where * stands for one digit. What is the digit?

- ☐ A) 2
- ☐ B) 8
- ☐ C) 4
- ☐ D) 0
- ☐ E) 3

---

8 The number 7439* is divisible by 9, where * stands for one digit. What is the digit?

- ☐ A) 8
- ☐ B) 0
- ☐ C) 3
- ☐ D) 4
- ☐ E) 1

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9 Which of these numbers is divisible by 30?

- ☐ A) 750
- ☐ B) 948
- ☐ C) 620
- ☐ D) 924
- ☐ E) 665

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10 Which of these numbers is divisible by 36?

- ☐ A) 270
- ☐ B) 54
- ☐ C) 256
- ☐ D) 852
- ☐ E) 1044

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11 Find a three-digit descending-consecutive digit number (digits like 7,6,5) that is divisible by 3 and by 5.

(1)

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12 The number 8*7 is divisible by 9, where * stands for one digit. What is the digit?

- ☐ A) 1
- ☐ B) 4
- ☐ C) 8
- ☐ D) 2
- ☐ E) 3

---

13 Which of these numbers is divisible by 30?

- ☐ A) 220
- ☐ B) 654
- ☐ C) 810
- ☐ D) 648
- ☐ E) 905

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14 Which of these numbers is divisible by 30?

- [ ] A) 835
- [ ] B) 786
- [ ] C) 435
- [ ] D) 78
- [ ] E) 270

---

15 Which of these numbers is divisible by 18?

- [ ] A) 686
- [ ] B) 999
- [ ] C) 696
- [ ] D) 189
- [ ] E) 108

---

16 Which of these numbers is divisible by 20?

- [ ] A) 240
- [ ] B) 215
- [ ] C) 628
- [ ] D) 672
- [ ] E) 945

---

17 The number 5*2 is divisible by 9, where * stands for one digit. What is the digit?

- [ ] A) 1
- [ ] B) 2
- [ ] C) 3
- [ ] D) 8
- [ ] E) 5

---

18 The number 7*6 is divisible by 9, where * stands for one digit. What is the digit?

- [ ] A) 2
- [ ] B) 5
- [ ] C) 8
- [ ] D) 1
- [ ] E) 4

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19 Which of these numbers is divisible by 12?

- [ ] A) 340
- [ ] B) 363
- [ ] C) 76
- [ ] D) 204
- [ ] E) 531

---

20 Which of these numbers is divisible by 36?

- [ ] A) 196
- [ ] B) 351
- [ ] C) 472
- [ ] D) 1296
- [ ] E) 495

---

21 The number 779* is divisible by 9, where * stands for one digit. What is the digit?

- [ ] A) 5
- [ ] B) 1
- [ ] C) 4
- [ ] D) 0
- [ ] E) 8

---

22 Which of these numbers is divisible by 12?

- [ ] A) 288
- [ ] B) 615
- [ ] C) 772
- [ ] D) 820
- [ ] E) 489

---

23 Which of these numbers is divisible by 15?

- [ ] A) 585
- [ ] B) 873
- [ ] C) 775
- [ ] D) 335
- [ ] E) 774

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24 The number 3*2 is divisible by 9, where * stands for one digit. What is the digit?

- [ ] A) 1
- [ ] B) 5
- [ ] C) 7
- [ ] D) 4
- [ ] E) 9

---

25 Which of these numbers is divisible by 18?

- [ ] A) 135
- [ ] B) 110
- [ ] C) 756
- [ ] D) 261
- [ ] E) 608

---

26 Which of these numbers is divisible by 12?

- [ ] A) 516
- [ ] B) 579
- [ ] C) 272
- [ ] D) 363
- [ ] E) 832

---

27 Which of these numbers is divisible by 30?

- [ ] A) 432
- [ ] B) 174
- [ ] C) 140
- [ ] D) 760
- [ ] E) 1500

---

28 The number 73*5 is divisible by 9, where * stands for one digit. What is the digit?

- [ ] A) 3
- [ ] B) 9
- [ ] C) 4
- [ ] D) 5
- [ ] E) 2

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29 Which of these numbers is divisible by 20?

- [ ] A) 965
- [ ] B) 295
- [ ] C) 288
- [ ] D) 464
- [ ] E) 640

---

30 Which of these numbers is divisible by 18?

- [ ] A) 504
- [ ] B) 99
- [ ] C) 350
- [ ] D) 310
- [ ] E) 531

---

31 The number 15*64 is divisible by 9, where * stands for one digit. What is the digit?

- [ ] A) 3
- [ ] B) 9
- [ ] C) 1
- [ ] D) 7
- [ ] E) 2

---

32 The number 4*125 is divisible by 11, where * stands for one digit. What is the digit?

- [ ] A) 4
- [ ] B) 9
- [ ] C) 6
- [ ] D) 1
- [ ] E) 8

---

33 The number 88*8 is divisible by 11, where * stands for one digit. What is the digit?

- [ ] A) 4
- [ ] B) 0
- [ ] C) 1
- [ ] D) 8
- [ ] E) 2

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34 The number 4*3 is divisible by 9, where * stands for one digit. What is the digit?

- ☐ A) 6
- ☐ B) 2
- ☐ C) 3
- ☐ D) 1
- ☐ E) 4

---

35 Is it possible for a number to be divisible by 3 and by 4 but not divisible by 2? Give a reason for your answer.

(1)

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36 Which of these numbers is divisible by 12?

- ☐ A) 369
- ☐ B) 776
- ☐ C) 588
- ☐ D) 932
- ☐ E) 975

---

37 Which of these numbers is divisible by 12?

- ☐ A) 488
- ☐ B) 868
- ☐ C) 141
- ☐ D) 990
- ☐ E) 144

---

38 Which of these numbers is divisible by 24?

- ☐ A) 448
- ☐ B) 696
- ☐ C) 952
- ☐ D) 822
- ☐ E) 501

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39 The number 8345* is divisible by 9, where * stands for one digit. What is the digit?

- ☐ A) 1
- ☐ B) 3
- ☐ C) 2
- ☐ D) 7
- ☐ E) 4

---

40 The number 1*691 is divisible by 9, where * stands for one digit. What is the digit?

- ☐ A) 1
- ☐ B) 9
- ☐ C) 3
- ☐ D) 5
- ☐ E) 2

---

41 Is there a digit x (0 to 9) that can be placed in 2x9 to make the three-digit number divisible by both 3 and 4? Explain your answer.

(1)

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42 Which of these numbers is divisible by 12?

- ☐ A) 681
- ☐ B) 352
- ☐ C) 324
- ☐ D) 712
- ☐ E) 786

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43 Find all two-digit numbers ab (a and b are non-zero digits and a ≠ b) such that the number ab is divisible by 4 and the reversed number ba is divisible by 3.

(3)

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44 Priya thinks of a number n. She finds that n leaves remainder 1 when divided by 3, remainder 2 when divided by 4, and remainder 3 when divided by 5. Work out the smallest positive value of n.

(2)

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Mark scheme · 2.87 Divisibility Rules and Number Property Puzzles: Test Pack

Question 1

correct option B (249) cao **B1**

Answer: B) 249 is divisible by 3 (2 + 4 + 9 = 15, which is a multiple of 3). (Answer: B) 249.)

Question 2

correct option D (4) cao **B1**

Answer: D) 4

Question 3

correct option C (2) cao **B1**

Answer: C) 2

Question 4

correct option B (1080) cao **B1**

Answer: B) 1080

Question 5

correct option A (90) cao **B1**

Answer: A) 90

Question 6

d = 3 cao **B1**

Answer: 3

Question 7

correct option E (3) cao **B1**

Answer: E) 3

Question 8

correct option D (4) cao **B1**

Answer: D) 4

Question 9

correct option A (750) cao **B1**

Answer: A) 750

Question 10

correct option E (1044) cao **B1**

Answer: E) 1044

Question 11

any correct example, e.g. 765 or 210 oe **B1**

Answer: 765 (or 210)

Question 12

correct option E (3) cao **B1**

Answer: E) 3

Question 13

correct option C (810) cao **B1**

Answer: C) 810

Question 14

correct option E (270) cao **B1**

Answer: E) 270

Question 15

correct option E (108) cao **B1**

Answer: E) 108

Question 16

correct option A (240) cao **B1**

Answer: A) 240

Question 17

correct option B (2) cao **B1**

Answer: B) 2

Question 18

correct option B (5) cao **B1**

Answer: B) 5

Question 19

correct option D (204) cao **B1**

Answer: D) 204

Question 20

correct option D (1296) cao **B1**

Answer: D) 1296

Question 21

correct option C (4) cao **B1**

Answer: C) 4

Question 22

correct option A (288) cao **B1**

Answer: A) 288

Question 23

correct option A (585) cao **B1**

Answer: A) 585

Question 24

correct option D (4) cao **B1**

Answer: D) 4

Question 25

correct option C (756) cao **B1**

Answer: C) 756

Question 26

correct option A (516) cao **B1**

Answer: A) 516

Question 27

correct option E (1500) cao **B1**

Answer: E) 1500

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Question 28

correct option A (3) cao **B1**

Answer: A) 3

Question 29

correct option E (640) cao **B1**

Answer: E) 640

Question 30

correct option A (504) cao **B1**

Answer: A) 504

Question 31

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

Answer: E) 2

Question 32

correct option E (8) cao **B1**

Answer: E) 8

Question 33

correct option D (8) cao **B1**

Answer: D) 8

Question 34

correct option B (2) cao **B1**

Answer: B) 2

Question 35

No, because divisible by 4 implies the number is even (divisible by 2), so it cannot be not divisible by 2 cao **B1**

Answer: No. If a number is divisible by 4 it is even, so it must be divisible by 2.

Question 36

correct option C (588) cao **B1**

Answer: C) 588

Question 37

correct option E (144) cao **B1**

Answer: E) 144

Question 38

correct option B (696) cao **B1**

Answer: B) 696

Question 39

correct option D (7) cao **B1**

Answer: D) 7

Question 40

correct option A (1) cao **B1**

Answer: A) 1

Question 41

No; divisible by 4 requires last two digits x9 to be divisible by 4, but any number ending in 9 is odd so cannot be divisible by 4 cao **B1**

Answer: No. A number ending in 9 is odd so cannot be divisible by 4; therefore no digit x makes 2x9 divisible by 4 (hence not by 12).

Question 42

correct option C (324) cao **B1**

Answer: C) 324

Question 43

Realise conditions: $10a + b = 0 \pmod 4$ and $a + b = 0 \pmod 3$ (or equivalently $10b + a$ divisible by 3) shown **M1**

Explain search or reason to reduce possibilities (consider two-digit multiples of 4 with non-zero digits) **M1**

List: 12, 24, 36, 48, 72, 84, 96 cao **A1**

Answer: 12, 24, 36, 48, 72, 84, 96

Question 44

Use of congruences or systematic search to show $n = 20m + 18$ or equivalent CRT working **M1**

58 cao **A1**

Answer: 58

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