3.18 Number Connections: 30-minute Pack

GL ASSESSMENT GL-VR-11+ · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Each question shows two number pairs written in the same style, for example: 5 (12) 7 followed by 9 (?) 6. The number in brackets is linked to the two outside numbers by a hidden rule. Work out the rule from the first pair, then apply exactly the same rule to the second pair to work out the missing number in brackets. Choose your answer from the five options given. There is only one correct answer to each question.

Worked example. 5 (15) 3 8 (?) 6 Work out the connection between the numbers in the first pair, then use the same connection to find the missing number in the second pair. **Answer: 48.** The number in brackets is the product of the two outside numbers: 5 x 3 = 15. Applying the same rule to the second pair: 8 x 6 = 48.

1 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

8 (20) 6
10 (16) 3
9 (?) 7

- ☐ A) 23
- ☐ B) 24
- ☐ C) 20
- ☐ D) 22
- ☐ E) 130

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2 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

6 (100) 8
2 (13) 3
8 (?) 11

- ☐ A) 186
- ☐ B) 184
- ☐ C) 176
- ☐ D) 185
- ☐ E) 129

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3 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

3 (8) 4

11 (18) 6

5 (?) 8

- [ ] A) 15
- [ ] B) 14
- [ ] C) 13
- [ ] D) 69
- [ ] E) 32

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4 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

8 (18) 2

10 (66) 6

5 (?) 10

- [ ] A) 16
- [ ] B) 59
- [ ] C) 15
- [ ] D) 60
- [ ] E) 61

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5 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

11 (21) 5

8 (14) 3

4 (?) 10

- [ ] A) 24
- [ ] B) 25
- [ ] C) 50
- [ ] D) 22
- [ ] E) 23

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6 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

8 (10) 6

9 (13) 5

2 (?) 2

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

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7 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

12 (63) 9

11 (117) 2

7 (?) 6

- [ ] A) 12
- [ ] B) 39
- [ ] C) 13
- [ ] D) 14
- [ ] E) 49

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8 7 (9) 4

9 (?) 5

- [ ] A) 8
- [ ] B) 196
- [ ] C) 16
- [ ] D) 4
- [ ] E) 56

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9 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

4 (42) 8
7 (45) 5
5 (?) 7

- [ ] A) 44
- [ ] B) 46
- [ ] C) 11
- [ ] D) 45
- [ ] E) 22

---

10 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

10 (40) 10
11 (40) 9
6 (?) 8

- [ ] A) 29
- [ ] B) 40
- [ ] C) 27
- [ ] D) 62
- [ ] E) 28

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11 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

4 (45) 9
5 (48) 8
9 (?) 11

- [ ] A) 88
- [ ] B) 108
- [ ] C) 109
- [ ] D) 110
- [ ] E) 111

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12 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

11 (130) 3
10 (244) 12
4 (?) 4

- [ ] A) 20
- [ ] B) 32
- [ ] C) 12
- [ ] D) 33
- [ ] E) 31

---

13 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

6 (39) 7
9 (48) 7
2 (?) 12

- [ ] A) 15
- [ ] B) 22
- [ ] C) 42
- [ ] D) 43
- [ ] E) 41

---

14 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

10 (90) 9
7 (70) 10
12 (?) 9

- [ ] A) 107
- [ ] B) 108
- [ ] C) 63
- [ ] D) 109
- [ ] E) 31

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15 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

12 (39) 3

6 (63) 9

2 (?) 7

- [ ] A) 21
- [ ] B) 13
- [ ] C) 22
- [ ] D) 28
- [ ] E) 20

---

16 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

11 (20) 2

12 (16) 8

9 (?) 7

- [ ] A) 34
- [ ] B) 10
- [ ] C) 11
- [ ] D) 23
- [ ] E) 12

---

17 10 (14) 2

12 (?) 3

- [ ] A) 36
- [ ] B) 15
- [ ] C) 3
- [ ] D) 14
- [ ] E) 33

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18 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

12 (120) 10

7 (56) 8

10 (?) 11

- [ ] A) 111
- [ ] B) 19
- [ ] C) 31
- [ ] D) 110
- [ ] E) 109

---

19 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

7 (51) 2

4 (28) 12

10 (?) 9

- [ ] A) 20
- [ ] B) 110
- [ ] C) 18
- [ ] D) 108
- [ ] E) 109

---

20 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

10 (130) 12

2 (20) 9

5 (?) 10

- [ ] A) 54
- [ ] B) 55
- [ ] C) 125
- [ ] D) 45
- [ ] E) 56

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21 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

7 (22) 4

2 (24) 10

5 (?) 5

- [ ] A) 21
- [ ] B) 10
- [ ] C) 20
- [ ] D) 19
- [ ] E) 50

---

22 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

7 (56) 7

11 (60) 7

4 (?) 8

- [ ] A) 24
- [ ] B) 69
- [ ] C) 67
- [ ] D) 68
- [ ] E) 28

---

23 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

10 (130) 12

7 (56) 7

8 (?) 5

- [ ] A) 45
- [ ] B) 48
- [ ] C) 49
- [ ] D) 47
- [ ] E) 33

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24 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

8 (176) 11

4 (64) 8

6 (?) 2

- [ ] A) 23
- [ ] B) 9
- [ ] C) 16
- [ ] D) 25
- [ ] E) 24

---

25 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

9 (45) 6

12 (60) 8

5 (?) 2

- [ ] A) 7
- [ ] B) 20
- [ ] C) 6
- [ ] D) 21
- [ ] E) 22

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26 3 (20) 5

4 (?) 7

- [ ] A) 32
- [ ] B) 22
- [ ] C) 56
- [ ] D) 35
- [ ] E) 28

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27 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

4 (22) 3

10 (110) 10

6 (?) 3

- [ ] A) 45
- [ ] B) 36
- [ ] C) 28
- [ ] D) 29
- [ ] E) 27

---

28 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

11 (154) 7

5 (100) 10

12 (?) 2

- [ ] A) 49
- [ ] B) 16
- [ ] C) 22
- [ ] D) 48
- [ ] E) 47

---

29 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

2 (2) 2

9 (45) 6

12 (?) 10

- [ ] A) 154
- [ ] B) 108
- [ ] C) 109
- [ ] D) 32
- [ ] E) 107

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30 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

10 (34) 7
4 (28) 10
12 (?) 2

- [ ] A) 28
- [ ] B) 120
- [ ] C) 27
- [ ] D) 26
- [ ] E) 29

---

31 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

7 (27) 10
2 (18) 8
11 (?) 5

- [ ] A) 28
- [ ] B) 22
- [ ] C) 146
- [ ] D) 20
- [ ] E) 21

---

32 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

4 (8) 3
9 (63) 8
3 (?) 2

- [ ] A) 3
- [ ] B) 2
- [ ] C) 4
- [ ] D) 7
- [ ] E) 5

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33 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

11 (105) 4

6 (27) 3

8 (?) 4

- [ ] A) 24
- [ ] B) 20
- [ ] C) 48
- [ ] D) 49
- [ ] E) 47

---

34 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

3 (12) 3

10 (121) 11

6 (?) 8

- [ ] A) 96
- [ ] B) 57
- [ ] C) 13
- [ ] D) 56
- [ ] E) 55

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35 5 (7) 3

6 (?) 4

- [ ] A) 34
- [ ] B) -14
- [ ] C) 14
- [ ] D) 20
- [ ] E) 24

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36 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

6 (9) 3

3 (11) 8

7 (?) 7

- [ ] A) 13
- [ ] B) 14
- [ ] C) 15
- [ ] D) 56
- [ ] E) 98

---

37 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

3 (15) 2

11 (33) 12

8 (?) 11

- [ ] A) 28
- [ ] B) 185
- [ ] C) 30
- [ ] D) 129
- [ ] E) 29

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38 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

11 (22) 3

4 (8) 3

12 (?) 11

- [ ] A) 121
- [ ] B) 23
- [ ] C) 120
- [ ] D) 1
- [ ] E) 119

---

39 The numbers in the brackets are linked to the numbers outside by the same rule each time. Find the missing number.

10 (60) 3

7 (42) 3

12 (?) 3

- [ ] A) 45
- [ ] B) 72
- [ ] C) 73
- [ ] D) 71
- [ ] E) 16

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Mark scheme · 3.18 Number Connections: 30-minute Pack

Question 1

A) 23 - rule: double the second number and add it to the first; for 9 and 7 this gives 23 **B1**

Answer: A) 23

Question 2

D) 185 - rule: add the squares of the two numbers; for 8 and 11 this gives 185 **B1**

Answer: D) 185

Question 3

B) 14 - rule: add the two numbers then add 1; for 5 and 8 this gives 14 **B1**

Answer: B) 14

Question 4

D) 60 - rule: multiply the two numbers then add the second; for 5 and 10 this gives 60 **B1**

Answer: D) 60

Question 5

A) 24 - rule: double the second number and add it to the first; for 4 and 10 this gives 24 **B1**

Answer: A) 24

Question 6

B) 2 - rule: double the first number and subtract the second; for 2 and 2 this gives 2 **B1**

Answer: B) 2

Question 7

C) 13 - rule: multiply the sum by the difference; for 7 and 6 this gives 13 **B1**

Answer: C) 13

Question 8

C) 16 - rule is (subtract, then square the result): $(7 - 4)^2 = 9$, so $(9 - 5)^2 = 16$ **B1**

Answer: 16

Question 9

D) 45 - rule: multiply then add 10; for 5 and 7 this gives 45 **B1**

Answer: D) 45

Question 10

E) 28 - rule: add the two numbers then double; for 6 and 8 this gives 28 **B1**

Answer: E) 28

Question 11

D) 110 - rule: multiply the two numbers then add the second; for 9 and 11 this gives 110 **B1**

Answer: D) 110

Question 12

B) 32 - rule: add the squares of the two numbers; for 4 and 4 this gives 32 **B1**

Answer: B) 32

Question 13

C) 42 - rule: add the two numbers then multiply by 3; for 2 and 12 this gives 42 **B1**

Answer: C) 42

Question 14

B) 108 - rule: multiply the two outer numbers; for 12 and 9 this gives 108 **B1**

Answer: B) 108

Question 15

A) 21 - rule: multiply the two numbers then add the second; for 2 and 7 this gives 21 **B1**

Answer: A) 21

Question 16

C) 11 - rule: double the first number and subtract the second; for 9 and 7 this gives 11 **B1**

Answer: C) 11

Question 17

B) 15 - rule is (double the first number, subtract three times the second): (2 x 10) - (3 x 2) = 14, so (2 x 12) - (3 x 3) = 15 **B1**

Answer: 15

Question 18

D) 110 - rule: multiply the two outer numbers; for 10 and 11 this gives 110 **B1**

Answer: D) 110

Question 19

E) 109 - rule: square the first number and add the second; for 10 and 9 this gives 109 **B1**

Answer: E) 109

Question 20

B) 55 - rule: multiply the two numbers then add the first; for 5 and 10 this gives 55 **B1**

Answer: B) 55

Question 21

C) 20 - rule: add the two numbers then double; for 5 and 5 this gives 20 **B1**

Answer: C) 20

Question 22

D) 68 - rule: square the second number and add the first; for 4 and 8 this gives 68 **B1**

Answer: D) 68

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Question 23

B) 48 - rule: multiply the two numbers then add the first; for 8 and 5 this gives 48 **B1**

Answer: B) 48

Question 24

E) 24 - rule: multiply the two numbers then double; for 6 and 2 this gives 24 **B1**

Answer: E) 24

Question 25

D) 21 - rule: add the two numbers then multiply by 3; for 5 and 2 this gives 21 **B1**

Answer: D) 21

Question 26

D) 35 - rule is (multiply, then add the second number): (3 x 5) + 5 = 20, so (4 x 7) + 7 = 35 **B1**

Answer: 35

Question 27

C) 28 - rule: multiply then add 10; for 6 and 3 this gives 28 **B1**

Answer: C) 28

Question 28

D) 48 - rule: multiply the two numbers then double; for 12 and 2 this gives 48 **B1**

Answer: D) 48

Question 29

B) 108 - rule: multiply the two numbers then subtract the first; for 12 and 10 this gives 108 **B1**

Answer: B) 108

Question 30

A) 28 - rule: add the two numbers then double; for 12 and 2 this gives 28 **B1**

Answer: A) 28

Question 31

E) 21 - rule: double the second number and add it to the first; for 11 and 5 this gives 21 **B1**

Answer: E) 21

Question 32

A) 3 - rule: multiply the two numbers then subtract the first; for 3 and 2 this gives 3 **B1**

Answer: A) 3

Question 33

C) 48 - rule: subtract the square of the second number from the square of the first; for 8 and 4 this gives 48 **B1**

Answer: C) 48

Question 34

D) 56 - rule: multiply the two numbers then add the second; for 6 and 8 this gives 56 **B1**

Answer: D) 56

Question 35

C) 14 - rule is (multiply, then subtract the sum of the two numbers): (5 x 3) - (5 + 3) = 7, so (6 x 4) - (6 + 4) = 14 **B1**

Answer: 14

Question 36

B) 14 - rule: add the two outer numbers; for 7 and 7 this gives 14 **B1**

Answer: B) 14

Question 37

E) 29 - rule: add the two numbers then add 10; for 8 and 11 this gives 29 **B1**

Answer: E) 29

Question 38

C) 120 - rule: multiply the two numbers then subtract the first; for 12 and 11 this gives 120 **B1**

Answer: C) 120

Question 39

B) 72 - rule: multiply the two numbers then double; for 12 and 3 this gives 72 **B1**

Answer: B) 72

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