2.107 Function Machines and Simple Equations: 30-minute Pack

Total Marks

GL ASSESSMENT GL-11PLUS-MATHS · Calculators not allowed · about 30 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A function machine takes an input and does this: subtract 3, then multiply by 2. What is the output when the input is 25?

- ☐ A) 43
- ☐ B) 44
- ☐ C) 22
- ☐ D) 47
- ☐ E) 14

---

2 A function machine takes an input and does this: subtract 11, then divide by 3. What is the output when the input is 23?

- ☐ A) 4
- ☐ B) 5
- ☐ C) 102
- ☐ D) 12
- ☐ E) 3

---

3 A function machine takes an input and does this: add 13, then subtract 15. What is the output when the input is 21?

- ☐ A) 34
- ☐ B) 23
- ☐ C) 19
- ☐ D) 18
- ☐ E) 6

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4 A function machine takes an input and does this: subtract 2, then add 4. What is the output when the input is 29?

- [ ] A) 27
- [ ] B) 30
- [ ] C) 33
- [ ] D) 31
- [ ] E) 32

---

5 A function machine takes an input and does this: multiply by 7, then subtract 15. What is the output when the input is 6?

- [ ] A) 28
- [ ] B) 42
- [ ] C) -63
- [ ] D) 26
- [ ] E) 27

---

6 A function machine takes an input and does this: add 14, then subtract 4. What is the output when the input is 21?

- [ ] A) 11
- [ ] B) 31
- [ ] C) 35
- [ ] D) 17
- [ ] E) 30

---

7 A function machine takes an input and does this: subtract 5, then multiply by 9. What is the output when the input is 29?

- [ ] A) 215
- [ ] B) 216
- [ ] C) 217
- [ ] D) 256
- [ ] E) 24

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8 A function machine takes an input and does this: multiply by 9, then subtract 14. What is the output when the input is 20?

- ☐ A) 165
- ☐ B) 54
- ☐ C) 180
- ☐ D) 6
- ☐ E) 166

---

9 A function machine takes an input and does this: add 9, then divide by 2. What is the output when the input is 23?

- ☐ A) 28
- ☐ B) 17
- ☐ C) 32
- ☐ D) 16
- ☐ E) 15

---

10 A function machine takes an input and does this: add 13, then multiply by 8. What is the output when the input is 16?

- ☐ A) 29
- ☐ B) 141
- ☐ C) 232
- ☐ D) 128
- ☐ E) 231

---

11 A function machine takes an input and does this: multiply by 8, then subtract 2. What is the output when the input is 10?

- ☐ A) 80
- ☐ B) 79
- ☐ C) 64
- ☐ D) 8
- ☐ E) 78

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12 A function machine takes an input and does this: subtract 4, then multiply by 9. What is the output when the input is 11?

- ☐ A) 64
- ☐ B) 63
- ☐ C) 99
- ☐ D) 7
- ☐ E) 95

---

13 A function machine takes an input and does this: add 9, then subtract 13. What is the output when the input is 25?

- ☐ A) 21
- ☐ B) 29
- ☐ C) 34
- ☐ D) 20
- ☐ E) 22

---

14 A function machine takes an input and does this: subtract 3, then multiply by 9. What is the output when the input is 23?

- ☐ A) 204
- ☐ B) 207
- ☐ C) 20
- ☐ D) 180
- ☐ E) 179

---

15 A function machine takes an input and does this: subtract 6, then multiply by 4. What is the output when the input is 29?

- ☐ A) 110
- ☐ B) 93
- ☐ C) 91
- ☐ D) 92
- ☐ E) 23

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16 A function machine takes an input and does this: multiply by 6, then subtract 12. What is the output when the input is 19?

- [ ] A) 102
- [ ] B) 103
- [ ] C) 114
- [ ] D) 42
- [ ] E) 101

---

17 A function machine takes an input and does this: multiply by 2, then subtract 15. What is the output when the input is 18?

- [ ] A) 24
- [ ] B) 21
- [ ] C) 3
- [ ] D) 6
- [ ] E) 20

---

18 A function machine takes an input and does this: multiply by 2, then add 4. What is the output when the input is 15?

- [ ] A) 30
- [ ] B) 19
- [ ] C) 34
- [ ] D) 35
- [ ] E) 38

---

19 A function machine takes an input and does this: multiply by 7, then subtract 15. What is the output when the input is 16?

- [ ] A) 96
- [ ] B) 112
- [ ] C) 97
- [ ] D) 7
- [ ] E) 1

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20 A function machine takes an input and does this: add 15, then multiply by 6. What is the output when the input is 22?

- [ ] A) 37
- [ ] B) 132
- [ ] C) 221
- [ ] D) 147
- [ ] E) 222

---

21 A function machine takes an input and does this: multiply by 3, then add 8. What is the output when the input is 20?

- [ ] A) 28
- [ ] B) 60
- [ ] C) 68
- [ ] D) 69
- [ ] E) 84

---

22 A function machine takes an input and does this: add 11, then subtract 4. What is the output when the input is 11?

- [ ] A) 18
- [ ] B) 22
- [ ] C) 17
- [ ] D) 4
- [ ] E) 7

---

23 A function machine takes an input and does this: add 6, then subtract 3. What is the output when the input is 9?

- [ ] A) 6
- [ ] B) 15
- [ ] C) 11
- [ ] D) 12
- [ ] E) 13

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24 A function machine takes an input and does this: add 2, then multiply by 6. What is the output when the input is 7?

- ☐ A) 53
- ☐ B) 55
- ☐ C) 9
- ☐ D) 44
- ☐ E) 54

---

25 A function machine takes an input and does this: multiply by 3, then subtract 11. What is the output when the input is 24?

- ☐ A) 61
- ☐ B) 39
- ☐ C) 62
- ☐ D) 19
- ☐ E) 72

---

26 A function machine takes an input and does this: add 12, then multiply by 5. What is the output when the input is 5?

- ☐ A) 86
- ☐ B) 37
- ☐ C) 85
- ☐ D) 84
- ☐ E) 17

---

27 A function machine takes an input and does this: add 9, then subtract 4. What is the output when the input is 30?

- ☐ A) 34
- ☐ B) 35
- ☐ C) 39
- ☐ D) 36
- ☐ E) 25

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28 A function machine takes an input and does this: add 13, then multiply by 6. What is the output when the input is 10?

- ☐ A) 73
- ☐ B) 137
- ☐ C) 23
- ☐ D) 138
- ☐ E) 139

---

29 A function machine takes an input and does this: multiply by 2, then subtract 4. What is the output when the input is 4?

- ☐ A) 4
- ☐ B) 5
- ☐ C) 3
- ☐ D) 6
- ☐ E) 0

---

30 Solve $x/3 + 4 = 10$. Show your working.

(2)

---

31 Input 4 goes through machine f then g. f adds 2 and g multiplies by 3. What is the final output?

- ☐ A) 18
- ☐ B) 10
- ☐ C) 12
- ☐ D) 8
- ☐ E) 14

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Mark scheme · 2.107 Function Machines and Simple Equations: 30-minute Pack

Question 1

correct option B (44) cao **B1**

Answer: B) 44

Question 2

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

Answer: A) 4

Question 3

correct option C (19) cao **B1**

Answer: C) 19

Question 4

correct option D (31) cao **B1**

Answer: D) 31

Question 5

correct option E (27) cao **B1**

Answer: E) 27

Question 6

correct option B (31) cao **B1**

Answer: B) 31

Question 7

correct option B (216) cao **B1**

Answer: B) 216

Question 8

correct option E (166) cao **B1**

Answer: E) 166

Question 9

correct option D (16) cao **B1**

Answer: D) 16

Question 10

correct option C (232) cao **B1**

Answer: C) 232

Question 11

correct option E (78) cao **B1**

Answer: E) 78

Question 12

correct option B (63) cao **B1**

Answer: B) 63

Question 13

correct option A (21) cao **B1**

Answer: A) 21

Question 14

correct option D (180) cao **B1**

Answer: D) 180

Question 15

correct option D (92) cao **B1**

Answer: D) 92

Question 16

correct option A (102) cao **B1**

Answer: A) 102

Question 17

correct option B (21) cao **B1**

Answer: B) 21

Question 18

correct option C (34) cao **B1**

Answer: C) 34

Question 19

correct option C (97) cao **B1**

Answer: C) 97

Question 20

correct option E (222) cao **B1**

Answer: E) 222

Question 21

correct option C (68) cao **B1**

Answer: C) 68

Question 22

correct option A (18) cao **B1**

Answer: A) 18

Question 23

correct option D (12) cao **B1**

Answer: D) 12

Question 24

correct option E (54) cao **B1**

Answer: E) 54

Question 25

correct option A (61) cao **B1**

Answer: A) 61

Question 26

correct option C (85) cao **B1**

Answer: C) 85

Question 27

correct option B (35) cao **B1**

Answer: B) 35

Question 28

correct option D (138) cao **B1**

Answer: D) 138

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Question 29

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

Answer: A) 4

Question 30

x/3 = 6 or equivalent method seen **M1**

x = 18 cao **A1**

Answer: x = 18

Question 31

option A (18) cao **B1**

Answer: A) 18

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