2.107 Function Machines and Simple Equations: 1-hour Pack

Total Marks

GL ASSESSMENT GL-11PLUS-MATHS · Calculators not allowed · about 60 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A function machine takes an input and does this: add 4, then subtract 2. What is the output when the input is 11?

- ☐ A) 14
- ☐ B) 9
- ☐ C) 15
- ☐ D) 12
- ☐ E) 13

---

2 A function machine takes an input and does this: add 10, then subtract 3. What is the output when the input is 24?

- ☐ A) 21
- ☐ B) 31
- ☐ C) 17
- ☐ D) 32
- ☐ E) 34

---

3 A function machine takes an input and does this: add 11, then multiply by 5. What is the output when the input is 21?

- ☐ A) 116
- ☐ B) 105
- ☐ C) 161
- ☐ D) 160
- ☐ E) 2

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4 A function machine takes an input and does this: multiply by 8, then subtract 12. What is the output when the input is 25?

- ☐ A) 189
- ☐ B) 200
- ☐ C) 104
- ☐ D) 13
- ☐ E) 188

---

5 A machine does: add 5 then multiply by 2. The output is 26. What was the input? Show your working.

(2)

---

6 A function machine takes an input and does this: add 15, then multiply by 6. What is the output when the input is 10?

- ☐ A) 75
- ☐ B) 151
- ☐ C) 150
- ☐ D) 25
- ☐ E) 60

---

7 A function machine takes an input and does this: subtract 7, then add 14. What is the output when the input is 25?

- ☐ A) 18
- ☐ B) 32
- ☐ C) 33
- ☐ D) 31
- ☐ E) 39

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8 A machine divides by 2 then adds 7. The final output is 15. What was the original input? Show your working.

(2)

---

9 A function machine takes an input and does this: add 9, then divide by 5. What is the output when the input is 21?

- ☐ A) 60
- ☐ B) 30
- ☐ C) 7
- ☐ D) 6
- ☐ E) 5

---

10 A function machine takes an input and does this: multiply by 4, then subtract 13. What is the output when the input is 24?

- ☐ A) 84
- ☐ B) 83
- ☐ C) 44
- ☐ D) 19
- ☐ E) 82

---

11 A function machine takes an input and does this: multiply by 9, then add 5. What is the output when the input is 28?

- ☐ A) 297
- ☐ B) 258
- ☐ C) 252
- ☐ D) 257
- ☐ E) 33

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12 A function machine takes an input and does this: multiply by 9, then subtract 15. What is the output when the input is 5?

- [ ] A) 31
- [ ] B) 30
- [ ] C) -90
- [ ] D) 29
- [ ] E) 45

---

13 A function machine takes an input and does this: subtract 5, then divide by 4. What is the output when the input is 25?

- [ ] A) 5
- [ ] B) 6
- [ ] C) 4
- [ ] D) 120
- [ ] E) 20

---

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

- [ ] A) 23
- [ ] B) 3
- [ ] C) 24
- [ ] D) 26
- [ ] E) 10

---

15 A function machine takes an input and does this: add 8, then multiply by 6. What is the output when the input is 3?

- [ ] A) 11
- [ ] B) 65
- [ ] C) 18
- [ ] D) 26
- [ ] E) 66

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16 A function machine takes an input and does this: subtract 11, then add 10, then multiply by 7. What is the output when the input is 26?

- ☐ A) 176
- ☐ B) 174
- ☐ C) 25
- ☐ D) 175
- ☐ E) 181

---

17 A function machine takes an input and does this: subtract 15, then add 13. What is the output when the input is 29?

- ☐ A) 31
- ☐ B) 14
- ☐ C) 26
- ☐ D) 27
- ☐ E) 28

---

18 A function machine takes an input and does this: subtract 13, then add 14. What is the output when the input is 27?

- ☐ A) 28
- ☐ B) 29
- ☐ C) 26
- ☐ D) 41
- ☐ E) 14

---

19 A function machine takes an input and does this: subtract 9, then multiply by 4, then add 6. What is the output when the input is 24?

- ☐ A) 102
- ☐ B) 111
- ☐ C) 60
- ☐ D) 65
- ☐ E) 66

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20 A function machine takes an input and does this: add 6, then multiply by 7. What is the output when the input is 20?

- ☐ A) 183
- ☐ B) 182
- ☐ C) 2
- ☐ D) 181
- ☐ E) 146

---

21 A function machine takes an input and does this: subtract 10, then multiply by 7. What is the output when the input is 11?

- ☐ A) 8
- ☐ B) 6
- ☐ C) 67
- ☐ D) 3
- ☐ E) 7

---

22 A function machine takes an input and does this: subtract 2, then add 12. What is the output when the input is 27?

- ☐ A) 25
- ☐ B) 36
- ☐ C) 39
- ☐ D) 37
- ☐ E) 17

---

23 A function machine takes an input and does this: add 5, then divide by 4, then multiply by 8. What is the output when the input is 28?

- ☐ A) 66
- ☐ B) 65
- ☐ C) 67
- ☐ D) 61
- ☐ E) 56

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24 A function machine takes an input and does this: subtract 2, then multiply by 3. What is the output when the input is 6?

- [ ] A) 13
- [ ] B) 4
- [ ] C) 12
- [ ] D) 16
- [ ] E) 11

---

25 A function machine takes an input and does this: add 8, then multiply by 5. What is the output when the input is 12?

- [ ] A) 68
- [ ] B) 100
- [ ] C) 60
- [ ] D) 20
- [ ] E) 99

---

26 A function machine takes an input and does this: divide by 3, then multiply by 4. What is the output when the input is 15?

- [ ] A) 19
- [ ] B) 5
- [ ] C) 60
- [ ] D) 21
- [ ] E) 20

---

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

- [ ] A) 81
- [ ] B) 96
- [ ] C) 24
- [ ] D) 80
- [ ] E) 10

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28 A function machine takes an input and does this: multiply by 3, then subtract 12. What is the output when the input is 8?

- [ ] A) 13
- [ ] B) -12
- [ ] C) 24
- [ ] D) 11
- [ ] E) 12

---

29 A function machine takes an input and does this: add 7, then multiply by 3. What is the output when the input is 13?

- [ ] A) 46
- [ ] B) 60
- [ ] C) 61
- [ ] D) 59
- [ ] E) 2

---

30 A function machine takes an input and does this: subtract 9, then add 2. What is the output when the input is 16?

- [ ] A) 7
- [ ] B) 8
- [ ] C) 9
- [ ] D) 10
- [ ] E) 23

---

31 A function machine takes an input and does this: subtract 4, then add 9. What is the output when the input is 19?

- [ ] A) 24
- [ ] B) 14
- [ ] C) 23
- [ ] D) 25
- [ ] E) 15

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32 A function machine takes an input and does this: multiply by 5, then add 6. What is the output when the input is 28?

- [ ] A) 145
- [ ] B) 140
- [ ] C) 146
- [ ] D) 147
- [ ] E) 170

---

33 A function machine takes an input and does this: add 6, then subtract 11, then multiply by 4. What is the output when the input is 22?

- [ ] A) 68
- [ ] B) 83
- [ ] C) 69
- [ ] D) 17
- [ ] E) 67

---

34 A function machine takes an input and does this: multiply by 3, then add 7. What is the output when the input is 6?

- [ ] A) -5
- [ ] B) 18
- [ ] C) 39
- [ ] D) 24
- [ ] E) 25

---

35 A function machine takes an input and does this: multiply by 6, then subtract 4. What is the output when the input is 24?

- [ ] A) 141
- [ ] B) 140
- [ ] C) 139
- [ ] D) 120
- [ ] E) 8

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36 A function machine takes an input and does this: add 8, then subtract 10. What is the output when the input is 27?

- [ ] A) 24
- [ ] B) 35
- [ ] C) 26
- [ ] D) 25
- [ ] E) 29

---

37 A function machine takes an input and does this: subtract 7, then add 11, then divide by 3. What is the output when the input is 2?

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

---

38 A function machine takes an input and does this: subtract 8, then multiply by 4. What is the output when the input is 28?

- [ ] A) 81
- [ ] B) 104
- [ ] C) 9
- [ ] D) 79
- [ ] E) 80

---

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

- [ ] A) 96
- [ ] B) 4
- [ ] C) 24
- [ ] D) 84
- [ ] E) 23

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40 A function machine takes an input and does this: add 4, then multiply by 7, then subtract 12. What is the output when the input is 29?

- [ ] A) 220
- [ ] B) 219
- [ ] C) 123
- [ ] D) 191
- [ ] E) 231

---

41 A function machine takes an input and does this: multiply by 3, then add 4. What is the output when the input is 7?

- [ ] A) 24
- [ ] B) 11
- [ ] C) 21
- [ ] D) 25
- [ ] E) 33

---

42 A function machine takes an input and does this: add 2, then multiply by 8. What is the output when the input is 17?

- [ ] A) 19
- [ ] B) 138
- [ ] C) 151
- [ ] D) 152
- [ ] E) 136

---

43 A function machine takes an input and does this: multiply by 3, then add 5. What is the output when the input is 28?

- [ ] A) 33
- [ ] B) 89
- [ ] C) 88
- [ ] D) 99
- [ ] E) 84

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44 A function machine takes an input and does this: subtract 13, then multiply by 4. What is the output when the input is 30?

- [ ] A) 17
- [ ] B) 107
- [ ] C) 68
- [ ] D) 67
- [ ] E) 120

---

45 A function machine takes an input and does this: multiply by 3, then add 6. What is the output when the input is 6?

- [ ] A) -4
- [ ] B) 25
- [ ] C) 12
- [ ] D) 36
- [ ] E) 24

---

46 A function machine takes an input and does this: multiply by 7, then subtract 6. What is the output when the input is 3?

- [ ] A) 16
- [ ] B) 15
- [ ] C) -21
- [ ] D) 21
- [ ] E) -3

---

47 A function machine takes an input and does this: add 9, then multiply by 6. What is the output when the input is 29?

- [ ] A) 228
- [ ] B) 183
- [ ] C) 174
- [ ] D) 38
- [ ] E) 227

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48 A function machine takes an input and does this: multiply by 3, then subtract 14, then add 13. What is the output when the input is 8?

- [ ] A) 24
- [ ] B) 10
- [ ] C) 22
- [ ] D) 23
- [ ] E) 21

---

49 A function machine takes an input and does this: subtract 5, then add 14. What is the output when the input is 7?

- [ ] A) 21
- [ ] B) 2
- [ ] C) -2
- [ ] D) 17
- [ ] E) 16

---

50 A function machine takes an input and does this: subtract 7, then add 5. What is the output when the input is 24?

- [ ] A) 26
- [ ] B) 23
- [ ] C) 22
- [ ] D) 21
- [ ] E) 17

---

51 A function machine takes an input and does this: subtract 13, then multiply by 9, then add 6. What is the output when the input is 28?

- [ ] A) 293
- [ ] B) 140
- [ ] C) 141
- [ ] D) 142
- [ ] E) 135

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52 A function machine takes an input and does this: add 15, then multiply by 4. What is the output when the input is 5?

- [ ] A) 81
- [ ] B) 79
- [ ] C) 35
- [ ] D) 20
- [ ] E) 80

---

53 A function machine takes an input and does this: subtract 9, then multiply by 4. What is the output when the input is 20?

- [ ] A) 44
- [ ] B) 45
- [ ] C) 11
- [ ] D) 80
- [ ] E) 71

---

54 A function machine takes an input and does this: multiply by 4, then subtract 6, then add 5. What is the output when the input is 26?

- [ ] A) 100
- [ ] B) 98
- [ ] C) 103
- [ ] D) 25
- [ ] E) 102

---

55 A function machine takes an input and does this: add 10, then divide by 2. What is the output when the input is 28?

- [ ] A) 20
- [ ] B) 19
- [ ] C) 24
- [ ] D) 36
- [ ] E) 18

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

- ☐ A) 45
- ☐ B) 60
- ☐ C) 0
- ☐ D) 61
- ☐ E) 30

---

57 A function machine takes an input and does this: multiply by 7, then subtract 12. What is the output when the input is 2?

- ☐ A) -70
- ☐ B) 14
- ☐ C) 3
- ☐ D) 2
- ☐ E) 1

---

58 Solve $2x + 5 = 17$. Show your method.

(2)

---

59 A function machine takes an input and does this: subtract 4, then add 11. What is the output when the input is 2?

- ☐ A) -5
- ☐ B) 13
- ☐ C) 8
- ☐ D) -2
- ☐ E) 9

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60 A function machine takes an input and does this: multiply by 6, then add 2. What is the output when the input is 14?

- ☐ A) 84
- ☐ B) 87
- ☐ C) 86
- ☐ D) 96
- ☐ E) 85

---

61 A function machine takes an input and does this: multiply by 4, then subtract 2. What is the output when the input is 14?

- ☐ A) 55
- ☐ B) 53
- ☐ C) 56
- ☐ D) 54
- ☐ E) 48

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Question 1

correct option E (13) cao **B1**

Answer: E) 13

Question 2

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

Answer: B) 31

Question 3

correct option D (160) cao **B1**

Answer: D) 160

Question 4

correct option E (188) cao **B1**

Answer: E) 188

Question 5

(x + 5) x 2 = 26 seen or x + 5 = 13 **M1**

x = 8 cao **A1**

Answer: x = 8

Question 6

correct option C (150) cao **B1**

Answer: C) 150

Question 7

correct option B (32) cao **B1**

Answer: B) 32

Question 8

x/2 + 7 = 15 or x/2 = 8 seen **M1**

x = 16 cao **A1**

Answer: x = 16

Question 9

correct option D (6) cao **B1**

Answer: D) 6

Question 10

correct option B (83) cao **B1**

Answer: B) 83

Question 11

correct option D (257) cao **B1**

Answer: D) 257

Question 12

correct option B (30) cao **B1**

Answer: B) 30

Question 13

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

Answer: A) 5

Question 14

correct option A (23) cao **B1**

Answer: A) 23

Question 15

correct option E (66) cao **B1**

Answer: E) 66

Question 16

correct option D (175) cao **B1**

Answer: D) 175

Question 17

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

Answer: D) 27

Question 18

correct option A (28) cao **B1**

Answer: A) 28

Question 19

correct option E (66) cao **B1**

Answer: E) 66

Question 20

correct option B (182) cao **B1**

Answer: B) 182

Question 21

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

Answer: E) 7

Question 22

correct option D (37) cao **B1**

Answer: D) 37

Question 23

correct option A (66) cao **B1**

Answer: A) 66

Question 24

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

Answer: C) 12

Question 25

correct option B (100) cao **B1**

Answer: B) 100

Question 26

correct option E (20) cao **B1**

Answer: E) 20

Question 27

correct option D (80) cao **B1**

Answer: D) 80

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Question 28

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

Answer: E) 12

Question 29

correct option B (60) cao **B1**

Answer: B) 60

Question 30

correct option C (9) cao **B1**

Answer: C) 9

Question 31

correct option A (24) cao **B1**

Answer: A) 24

Question 32

correct option C (146) cao **B1**

Answer: C) 146

Question 33

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

Answer: A) 68

Question 34

correct option E (25) cao **B1**

Answer: E) 25

Question 35

correct option B (140) cao **B1**

Answer: B) 140

Question 36

correct option D (25) cao **B1**

Answer: D) 25

Question 37

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

Answer: C) 2

Question 38

correct option E (80) cao **B1**

Answer: E) 80

Question 39

correct option C (24) cao **B1**

Answer: C) 24

Question 40

correct option B (219) cao **B1**

Answer: B) 219

Question 41

correct option D (25) cao **B1**

Answer: D) 25

Question 42

correct option D (152) cao **B1**

Answer: D) 152

Question 43

correct option B (89) cao **B1**

Answer: B) 89

Question 44

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

Answer: C) 68

Question 45

correct option E (24) cao **B1**

Answer: E) 24

Question 46

correct option B (15) cao **B1**

Answer: B) 15

Question 47

correct option A (228) cao **B1**

Answer: A) 228

Question 48

correct option D (23) cao **B1**

Answer: D) 23

Question 49

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

Answer: E) 16

Question 50

correct option C (22) cao **B1**

Answer: C) 22

Question 51

correct option C (141) cao **B1**

Answer: C) 141

Question 52

correct option E (80) cao **B1**

Answer: E) 80

Question 53

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

Answer: A) 44

Question 54

correct option C (103) cao **B1**

Answer: C) 103

Question 55

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

Answer: B) 19

Question 56

correct option B (60) cao **B1**

Answer: B) 60

Question 57

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

Answer: D) 2

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Question 58

2x = 12 or equivalent method seen **M1**

x = 6 cao **A1**

Answer: x = 6

Question 59

correct option E (9) cao **B1**

Answer: E) 9

Question 60

correct option C (86) cao **B1**

Answer: C) 86

Question 61

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

Answer: D) 54

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