**1** A program is being developed to control the production line in a factory.

**(a)** A number of different program life cycles are available for the development of a program.

**(i)** Explain the need for different program development life cycles.

.....

..... [1]

**(ii)** Coding is a stage in a program development life cycle.

State **one** consideration that would influence the choice of programming language.

.....

..... [1]

**(b)** The program has been in use for a number of months and adaptive maintenance is required.

**(i)** Give **three** reasons why adaptive maintenance may be required.

1 .....

2 .....

3 .....
[3]

**(ii)** As well as adaptive maintenance, other types of program maintenance may be needed.

Identify **one** other type of program maintenance.

..... [1]

**(c)** Pseudocode has been used to design modules for the program to control the production line.

The table shows **four** valid pseudocode expressions.

Complete the table by giving the data type of the evaluated expression.

| Expression | Data type |
|---|---|
| `RIGHT(MachineCode, 4)` | |
| `Speed * 2.5` | |
| `NOT Status` | |
| `IS_NUM(Check)` | |

[4]

**(d)** A global array `Product` is used as part of the pseudocode design being developed to control the production line. `Product` is used to store the number of rejected items each day.

The following pseudocode statement is used to assign a value to an element of the array:

```
Product[x, y] ← 23
```

The lower and upper bound values are shown in the table:

| Variable | Lower bound | Upper bound |
|---|---|---|
| x | 0 | 99 |
| y | 0 | 9 |

**(i)** State the number of dimensions of `Product`

..... [1]

**(ii)** State the total number of elements in array `Product`

..... [1]

**(iii)** Give the pseudocode declaration for the array `Product`

..... [2]