Open the document **evidence.doc**.

Make sure that your name, centre number and candidate number will appear on every page of this document. This document must contain your answers to each question.

Save this evidence document in your work area as:

evidence_ followed by your centre number_candidate number, for example: evidence_zz999_9999

A class declaration can be used to declare a record.
If the programming language used does not support arrays, a list can be used instead.

A source file is used to answer question **2(e)**. The file is called `Pictures.txt`

1 Study the following pseudocode for a recursive function.

```
FUNCTION Unknown(BYVAL X, BYVAL Y : INTEGER) RETURNS INTEGER
  IF X < Y THEN
    OUTPUT X + Y
    RETURN (Unknown(X + 1, Y) * 2)
  ELSE
    IF X = Y THEN
      RETURN 1
    ELSE
      OUTPUT X + Y
      RETURN (Unknown(X - 1, Y) DIV 2)
    ENDIF
  ENDIF
ENDFUNCTION
```

The operator `DIV` returns the integer value after division e.g. `13 DIV 2` would give `6`

(a) Write program code to declare the function `Unknown()`.

Save your program as **question 1**. Copy and paste the program code into **part 1(a)** in the evidence document.

[3]

(b) The main program needs to run all **three** of the following function calls and output the result of each call:

```
Unknown(10, 15)
Unknown(10, 10)
Unknown(15, 10)
```

(i) For each of the **three** function calls, the main program needs to:

- output the value of the two parameters
- call the function with those parameters
- output the return value.

Write the program code for the main program.

Save your program. Copy and paste the program code into **part 1(b)(i)** in the evidence document.

[3]

(ii) Take a screenshot to show the output from **part (b)(i)**.

Copy and paste the screenshot into **part 1(b)(ii)** in the evidence document.

[2]

(c) Rewrite the function `Unknown()` as an iterative function, `IterativeUnknown()`.

Save your program. Copy and paste the program code into **part 1(c)** in the evidence document.

[7]

(d) The iterative function needs to be called **three** times with the same parameters as in **part (b)**.

(i) For each of the **three** function calls, the main program needs to:

- output the value of the two parameters
- call the iterative function with those parameters
- output the return value.

Amend the main program to perform these tasks.

Save your program. Copy and paste the program code into **part 1(d)(i)** in the evidence document.

[1]

(ii) Take one or more screenshots to show the output of both functions for each set of parameters.

Copy and paste the screenshot(s) into **part 1(d)(ii)** in the evidence document.

[1]