1. Victoria creates a program using an Integrated Development Environment (IDE).

Describe two tools or facilities that an IDE commonly provides.

**[4]**

2. Joseph is an author and programmer, and he needs to estimate how many pages his new book will have.

Each page has an average of 300 words. Each chapter starts with a chapter title page. The number of pages is estimated by;

- dividing the number of words by 300
- ignoring the decimal part of the division
- adding the number of chapters to this total.

Joseph uses the algorithm below to estimate the number of pages, but his algorithm does not give the correct result.

```
01 INPUT numberOfWords
02 INPUT numberOfChapters
03 CONST wordsPerPage = 300
04 numberOfPages = RoundDown(numberOfWords / wordsPerPage)
05 numberOfPages = numberOfWords + numberOfChapters
06 OUTPUT numberOfPages
```

Joseph has used a `RoundDown` function to remove the decimal part of the division, e.g. `RoundDown(6.2)` would return 6, `RoundDown(7.8)` would return 7.

Joseph is using an Integrated Development Environment (IDE) to produce the program.

One tool in an IDE that Joseph uses is a translator.

Describe **two** additional tools in an IDE that Joseph could use to help him produce his program.

Tool 1
name:

Tool 1
description:

Tool 2
name:

Tool 2
description:

**[4]**

**3.** The area of a circle is calculated using the formula $\Pi \times r^2$, where $\Pi$ is equal to 3.142 and r is the radius.

Finn has written a program to allow a user to enter the radius of a circle as a whole number, between 1 and 30, and output the area of the circle.

```
01    int radius = 0
02    real area = 0.0
03    input radius
04    if radius < 1 OR radius > 30 then
05    print ('Sorry, that radius is invalid')
06    else
07    area = 3.142 * (radius ^ 2)
08    print (area)
09    end if
```

Finn uses an IDE (Integrated Development Environment) to write his programs. Identify **two** features of an IDE that Finn might use.

**[2]**

**4.** Jim is writing a program to calculate the wages of workers in a teddy bear factory.

Jim uses an Integrated Development Environment (IDE) to create the program.

Describe **two** tools in an IDE that can help Jim when creating the program.

1

2

**[4]**

**END OF QUESTION PAPER**

# Mark scheme

| Question | | | Answer/Indicative content | Marks | Guidance |
|---|---|---|---|---|---|
| 1 | | | 1 mark per bullet, max 4.<br><br>e.g.<br><br>● Editor<br>● …to enable **program code** to be entered/edited<br>● Error diagnostics / debugging<br>● …to display information about errors (syntax / run-time) / location of errors<br>● … suggest solutions<br>● Run-time environment<br>● …to enable to the program to be run<br>● … check for run time errors / test the program<br>● Translator / compiler / interpreter<br>● …to convert the high level code into machine code / low level code / binary<br>● …to enable to code to be executed / run<br>● Breakpoints<br>● …to stop/pause program execution at a specific point<br>● Watch window<br>● …to check contents of variables<br>● Stepping<br>● …to execute program line by line<br>● Syntax completion…<br>● …suggests/corrects code<br>● Keyword highlighting / colour coding keywords / pretty printing…<br>● …colours command words / variables | **4** | One mark for identifying, one mark for describing. Accept description of a tool without (or with incorrect) naming of the tool.<br><br>Allow sensible descriptions which go across pairs or name other tools sensibly (e.g. editor / highlighting syntax)<br><br>Allow any sensible tool that an IDE provides (e.g. auto documentation, help tools, pretty printing etc.)<br><br>**Examiner's Comments**<br><br>Most candidates were able to gain at least some marks from this question, with a significant number able to access all 4 marks. A list of common tools and facilities available in an IDE is given in the specification (section 2.5 'Translators and facilities of languages') although other sensible tools that candidates may have had experience with were also accepted. Although many candidates were able to name the tools, they often struggled to describe these and give more comprehensive answers. Again, extensive practical use of a high-level language programming language alongside an IDE would have been extremely beneficial to candidates and centres. |
| | | | **Total** | **4** | |
| 2 | | | 1 mark for identification, 1 for matching description e.g.<br><br>● Error diagnostics / debugger<br>● … highlight errors / suggest changes<br><br>● Run-time environment<br>● … Lets you run / test the program<br><br>● Text editor<br>● …highlight key words<br>● …auto-indent<br>● …to type / edit source code<br>● …Auto-complete<br>● …highlight syntax errors<br><br>● Versioning tools<br>● …To allow for tracing back<br>● …To create new files with changes | 4 | Do not allow auto-documentation.<br>Can get description mark, without identification / incorrect identification<br><br>Allow:<br><br>● Variable watch / window<br>● See how the values change<br><br>Do not allow compiler / interpreter<br><br>**Examiner's Comments**<br><br>This question was appropriate programming theory and techniques.<br><br>This question was not answered well. Many candidates did not know what an IDE was, often giving utility programs as responses. A significant number of candidates gave compiler and interpreter as answers, showing that they did not understand that these are examples of the translator that was given in the question. The better candidates were able to name the tools, as given in the specification, and describe them. Marks were often given for descriptions of the tools, where they could not be named. |

| | | | | | |
|---|---|---|---|---|---|
| | | | • Stepping / breakpoints<br>• …Allow tracing of algorithms | | |
| | | | **Total** | **4** | |
| 3 | | | • Error diagnostics (any example)<br>• Run-time environment<br>• Editor (any feature such as auto-correct, auto-indent)<br>• Translator<br>• Version control<br>• Break point<br>• Stepping | 2 | 1 mark per bullet to a maximum of 2 marks.Only 1 example per bullet, e.g. auto-correct and auto-indent would only gain 1 mark. |
| | | | **Total** | **2** | |
| 4 | | | e.g.<br>• Editor<br>• Allows Jim to enter the program code<br>• Colour coding keywords<br>• Auto-completes code as you type.<br>• Compiler<br>• Transforms the written source code into machine code.<br>• Debugging tools<br>• Highlights errors in the code<br>• Suggests possible solutions.<br>(2 marks per tool) | 4 | Do not accept me spell check<br>**Examiner's Comments**<br>It was pleasing to see that candidates were using their experience of programming to answer the question. Where they did not gain full marks, this could have improved by providing further detail about the tools, or especially by using correct technical terms to describe these tools. |
| | | | **Total** | **4** | |