FOR OFFICIAL USE

National Qualifications 2017

Mark

X735/77/01 Graphic Communication

WEDNESDAY, 10 MAY
1:00 PM – 3:00 PM

X7357701

Fill in these boxes and read what is printed below.

Full name of centre

Town

Forename(s)

Surname

Number of seat

Date of birth

Day	Month	Year

Scottish candidate number

Total marks — 80

Attempt ALL questions.

All dimensions are in mm.

All technical sketches and drawings use third angle projection.

You may use rulers, compasses or trammels for measuring.

In all questions you may use sketches and annotations to support your answer if you wish.

Write your answers clearly in the spaces provided in this booklet. Additional space for answers is provided at the end of this booklet. If you use this space you must clearly identify the question number you are attempting.

Use **blue** or **black** ink.

Before leaving the examination room you must give this booklet to the Invigilator; if you do not, you may lose all the marks for this paper.

SQA ©

X735770101

Total marks — 80

Attempt ALL questions

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1. A manufacturing company has produced an excavator toy, which is shown below.

A CAD technician working for the company used bottom up modelling to create the individual parts. Sub-assemblies were then produced before being joined in the final model.

Drawings generated from the model are shown on the **Supplementary Sheets 1 and 2 for use with Question 1**.

1. (continued)

MARKS DO NOT WRITE IN THIS MARGIN

(a) Describe the 3D CAD constraints used to assemble the lever bend to the lever extension. You may use sketches to support your answer. **4**

You should refer to the left-hand lever sub-assembly shown on **Supplementary Sheet 1 for use with Question 1(a).**

[Turn over

1. (continued)

(b) On **Supplementary Sheet 2 for use with Question 1(b)** various views and a dimension have been annotated with the letters A to C.

Name each view or dimension **and** describe the information that it would provide to the manufacturer. You must use the correct British Standard terms.

(i) View A _____ **1**

(ii) View B _____ **1**

(iii) Dimension C _____ **1**

MARKS

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(c) A problem has been identified with the seat of the excavator toy and a redesign is required. Specific information about the current seat is saved within the following file formats — .DWG, .STL and .3DS

Explain how the information contained in these files would be used in the redesign of the replacement seat.

(i) .DWG _____ **1**

(ii) .STL _____ **1**

(iii) .3DS _____ **1**

[Turn over

(d) A CAD illustration of the seat detail is produced. The stages of creating this detail are shown below. Stage 4 shows the final illustration.

Stage 1

Stage 2

Stage 3

Stage 4

1. (d) (continued)

MARKS DO NOT WRITE IN THIS MARGIN

Name the computer-aided techniques which have been applied between the following stages of the process **and** explain how they have been used.

(i) Stage 1 to Stage 2 **1**

(ii) Stage 2 to Stage 3 **1**

(iii) Stage 3 to Stage 4 **1**

[Turn over

MARKS

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(e) A presentation about the excavator toy is to be created in printed and digital media using a variety of file types.

(i) State the name of a file type that could be used to show an animation of how the excavator toy is assembled. **1**

(ii) State the name of a **vector** file type that could be used to show a rendered image of the finished excavator toy. **1**

(iii) The printed presentation takes the form of a poster, which includes both images and text.

Explain what would need to be considered by the designer prior to the poster being sent to the print technician. **3**

[Turn over for next question

DO NOT WRITE ON THIS PAGE

2. A vacuum cleaner manufacturer uses **motion capture** technology as a test procedure to ensure that their products are easy and comfortable to use.

An image of the test is shown below.

(a) Motion capture has advantages and disadvantages.

(i) Describe three **advantages** of motion capture technology to the manufacturer. **3**

2. (a) (continued)

(ii) Describe three **disadvantages** of motion capture technology to the manufacturer. **3**

[Turn over

MARKS

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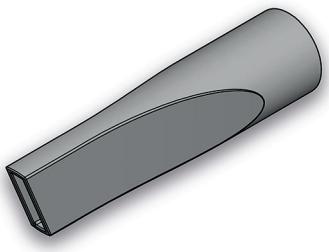
(b) After testing, the manufacturer wants to design a new nozzle. Two designs are being considered.

You should refer to **Supplementary Sheets 3 and 4 for use with Questions 2b(i) and (ii)**. Nozzle 1 is shown on Supplementary Sheet 3. Nozzle 2 is shown on Supplementary Sheet 4.

Describe the 3D CAD modelling techniques used to create the two replacement nozzles. You may use sketches to support your answer. Dimensions do **not** need to be included in your responses.

(i) Nozzle 1 **5**



MARKS

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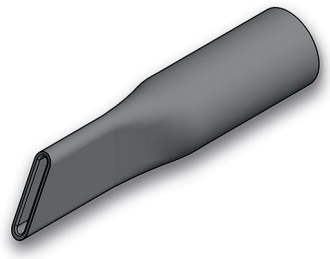
(ii) Nozzle 2

4



[Turn over

MARKS

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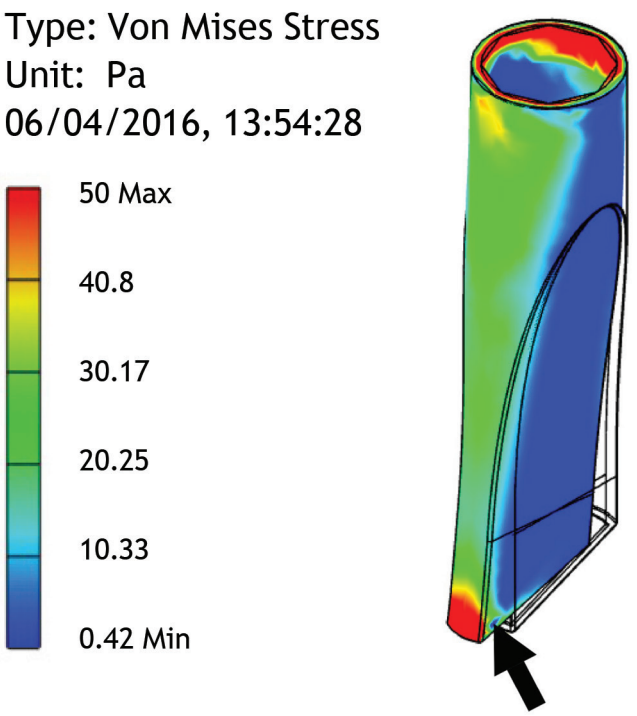
The 3D CAD models of the nozzles are being tested using Finite Element Analysis (FEA) methods.

The results of the test on Nozzle 1 are shown below.



(c) Describe four set-up requirements that are necessary **before** the FEA simulation test can begin. **4**

MARKS

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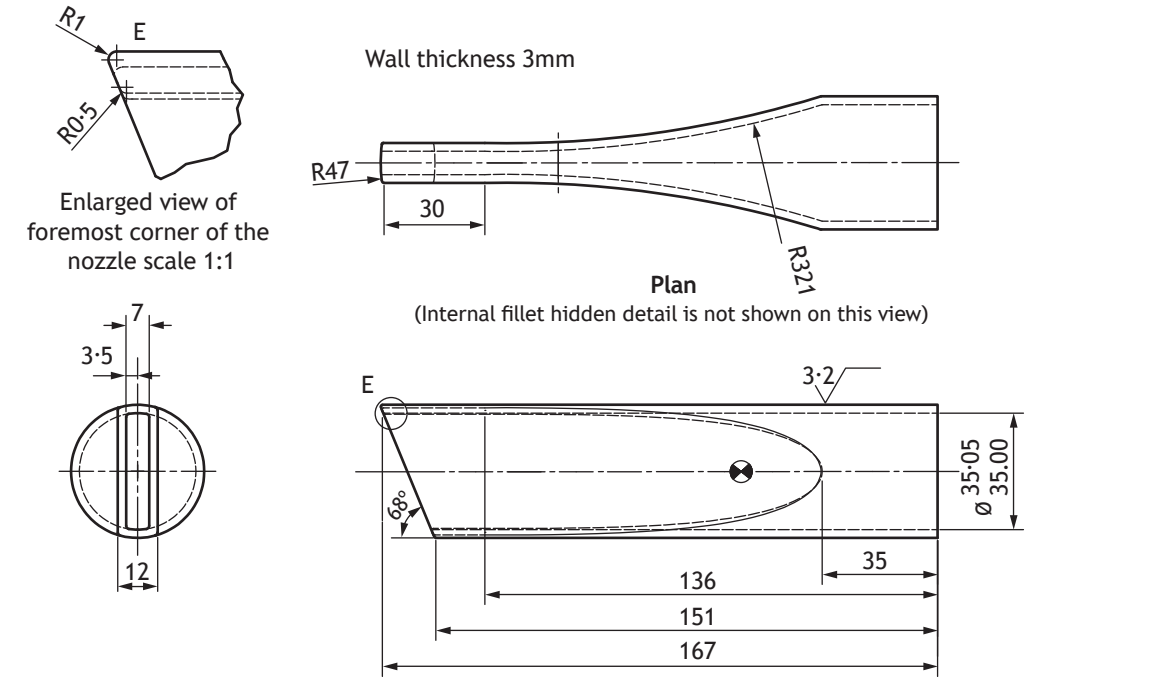
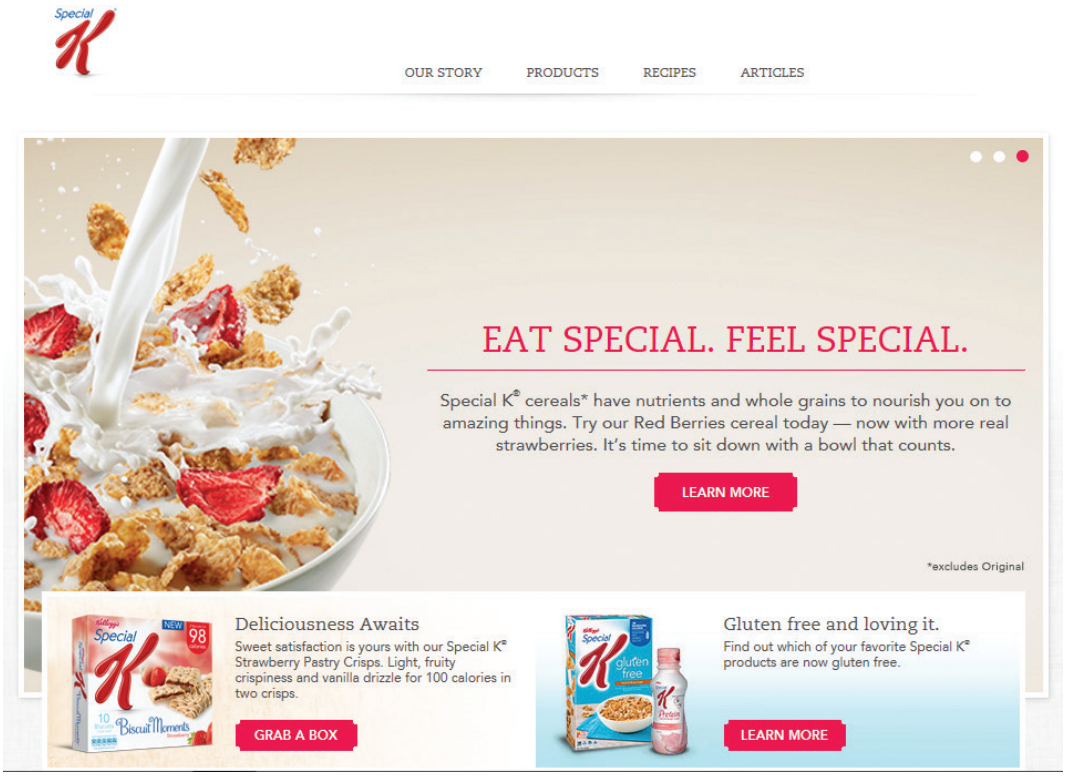
An orthographic CAD drawing of Nozzle 1 is shown below.



(d) Identify three pieces of information which have been included in the orthographic views shown above **and** explain how they would allow the nozzle to be manufactured using CAD CAM processes. **3**

3. A company has launched a series of products that carry the same branding.

The graphic designer has maintained the brand across a range of products and a website using design elements and principles.



Special K website homepage

(a) Identify four design elements or principles **and** explain how they have been used in the web page shown above. **4**

1 _____

_____

_____

2 _____

_____

_____

3 _____

_____

_____

MARKS

DO NOT WRITE IN THIS MARGIN

4 _____

_____

_____

(b) It is important that the branding on the web page exactly matches that on the product packaging. Three examples of this packaging are shown below.

Coated cardboard packaging for biscuits

Plastic packaging for individual cereal bars

Coated cardboard and foil yoghurt container with plastic lid

Describe three factors that a company may have to consider when maintaining consistency across digital and printed media. You must mention specific printed and digital media in your responses. **3**

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

3. (continued)

MARKS DO NOT WRITE IN THIS MARGIN

(c) A camera-ready copy of the biscuit packaging is produced.

Describe four requirements of a camera-ready copy for commercial printing. **4**

(d) State a suitable printing process to mass produce the cardboard biscuit packaging. **1**

MARKS | DO NOT WRITE IN THIS MARGIN

(e) Food manufacturers are required to display nutritional information on food packaging.

Two examples are shown below.

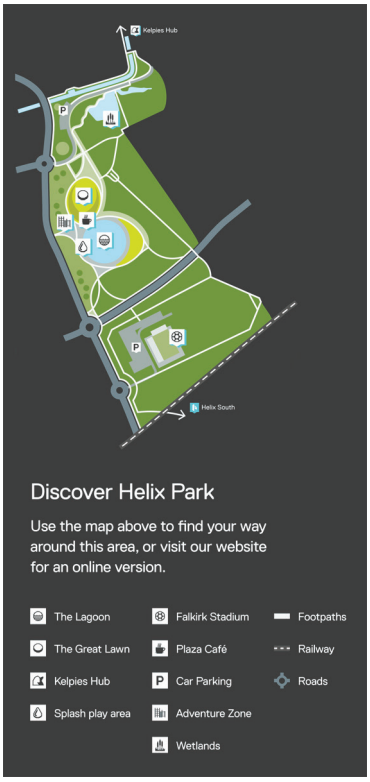
Label 1

Label 2

Explain, with reference to the labels shown above, how graphic techniques have been used to make the nutritional information as clear as possible. **4**

[Turn over

4. The Kelpies and surrounding Helix Park have become a popular tourist attraction in the heart of Scotland.



Aerial photograph of the Kelpies and the visitor's map of the Helix Park

(a) Prior to the construction of the Kelpies and Helix Park, three different surveys were undertaken.

Name three surveys **and** explain their purpose in ensuring the success of this project. **6**

Survey 1 _____

Purpose _____

_____

_____

_____

_____

_____

_____

_____

4. (a) (continued)

DO NOT WRITE IN THIS MARGIN

Survey 2 _____

Purpose _____

Survey 3 _____

Purpose _____

MARKS

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(b) Many professionals from the built environment sector were involved in the design and construction of the Kelpies sculptures. These included a model maker, structural engineer and a representative from the construction trades.

During the project they all made use of a computer generated 3D model of the sculptures.

Describe two ways the following professions could make use of the 3D computer model. **You must give different answers for each profession.**

(i) model maker **2**

(ii) structural engineer **2**

(iii) construction trades **2**

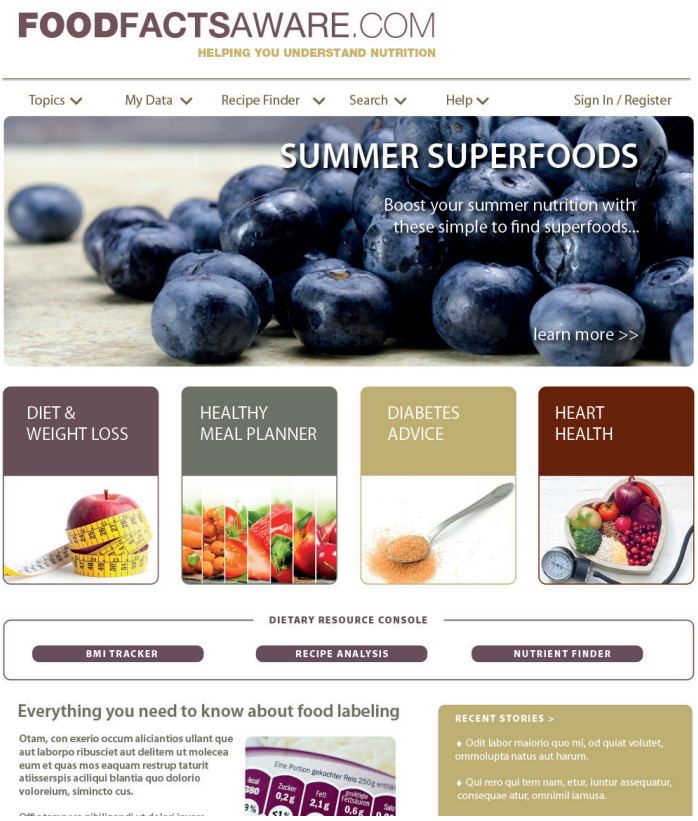
5. Advances in technology have changed the way in which we access information.

(a) Describe three ways an advertiser can use digital media to appeal to the consumer. **3**

MARKS

DO NOT WRITE IN THIS MARGIN

A website called "foodfactsaware.com" helps consumers understand more about information displayed on food packaging. The web page shown in the image below features drop down menus allowing consumers to access additional content. This takes the form of video interviews with professionals, printable fact sheets on nutrition and annotated photographs explaining food labelling.



(b) Explain how the web designer has made the website shown above informative and easy to use, with reference to the following.

(i) Web page layout **3**

5. (b) (continued)

MARKS DO NOT WRITE IN THIS MARGIN

(ii) User interface **3**

(iii) Graphic media file formats **3**

[END OF QUESTION PAPER]

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ADDITIONAL SPACE FOR ANSWERS

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ADDITIONAL SPACE FOR ANSWERS

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Acknowledgement of Copyright

Question 2	uu8 mmphotographie.de/shutterstock
Question 3(a) and (b)	Images of *Kelloggs Special K* products and screenshot of *Kelloggs Special K* homepage.
	SQA has made every effort to trace the owners of copyright materials in this question paper, and seek permissions. We will be happy to incorporate any missing acknowledgements. Please contact janine.anderson@sqa.org.uk.
Question 3(b)	Label 1 – Danicek/shutterstock.com
	Label 2 – SQA 2016
Question 4 (Image on left)	Aerial photograph of the Kelpies by Ken Whitcomb is reproduced by permission of Aerial Photography Solutions. © Photo: Aerial Photography Solutions.
Question 4 (Image on right)	Visitor's map of Helix Park is taken from (www.thehelix.co.uk). Reproduced by kind permission of The Helix (Falkirk Community Trust).
Question 5(a)	Nata-Lia/shutterstock.com
Question 5(b)	jill-erin/shutterstock.com
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National Qualifications 2017

X735/77/11

Graphic Communication Supplementary Sheets

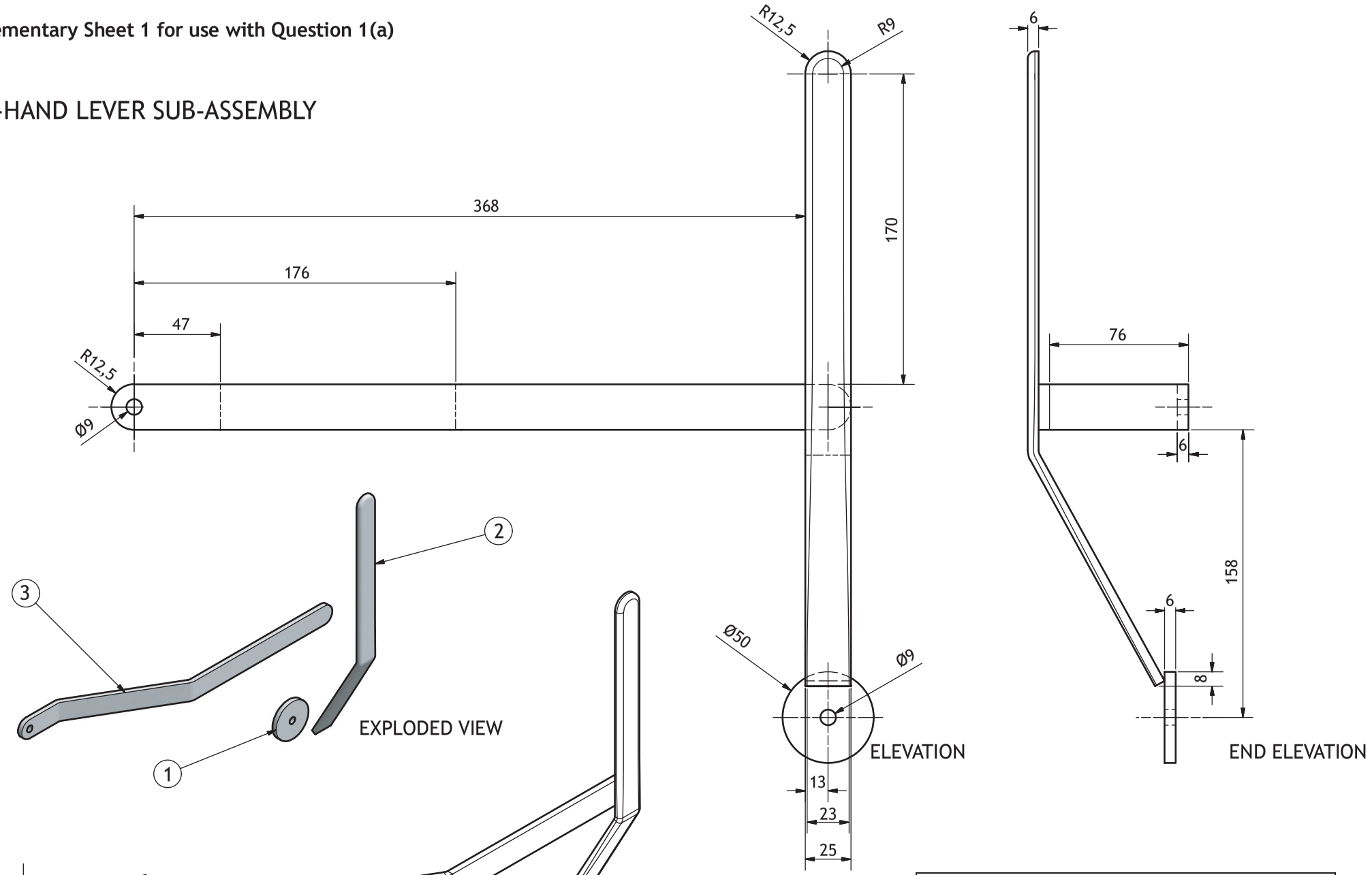
WEDNESDAY, 10 MAY
1:00 PM – 3:00 PM

Supplementary sheets for use with Questions 1 and 2.

X7357711

Supplementary Sheet 1 for use with Question 1(a)

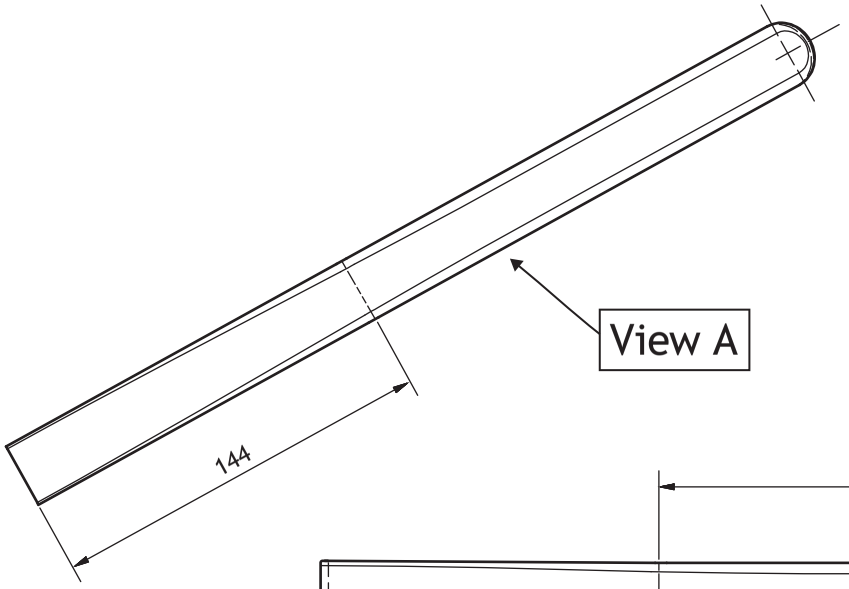
LEFT-HAND LEVER SUB-ASSEMBLY

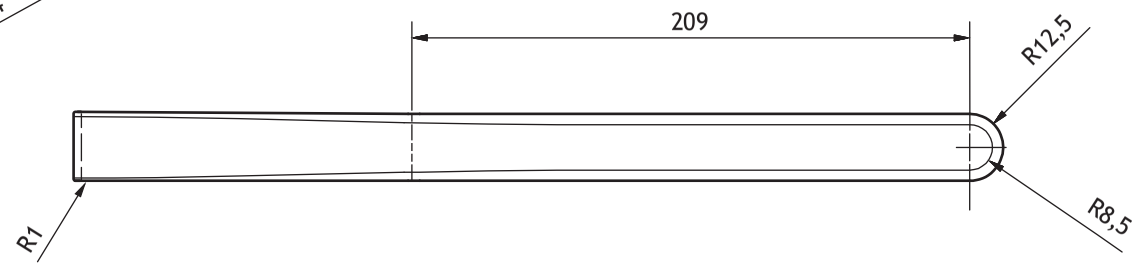


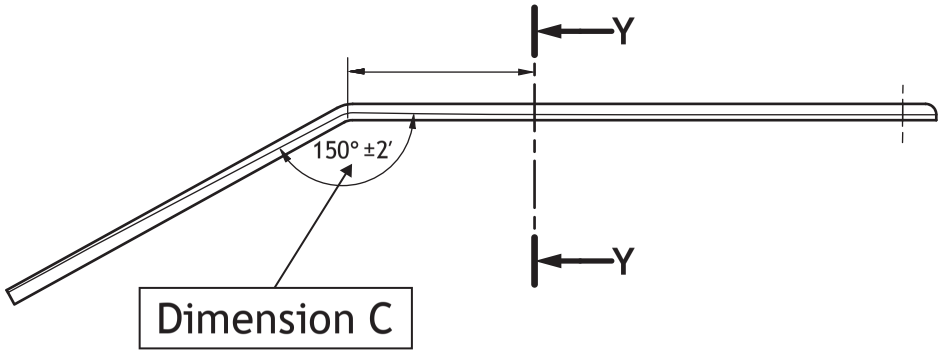
PARTS LIST		
ITEM	QTY	PART NUMBER
1	1	LEVER BASE PAD
2	1	LEVER BEND
3	1	LEVER EXTENSION

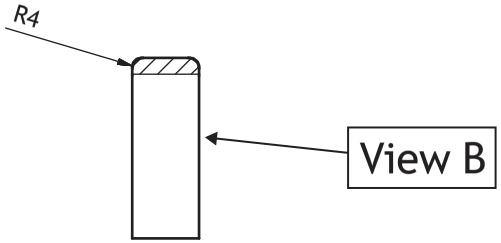
LEVER BEND

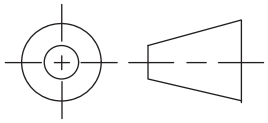

Lever Bend


View A
144


209
R12,5
R1
R8,5


Y
150° ±2'
Y
Dimension C

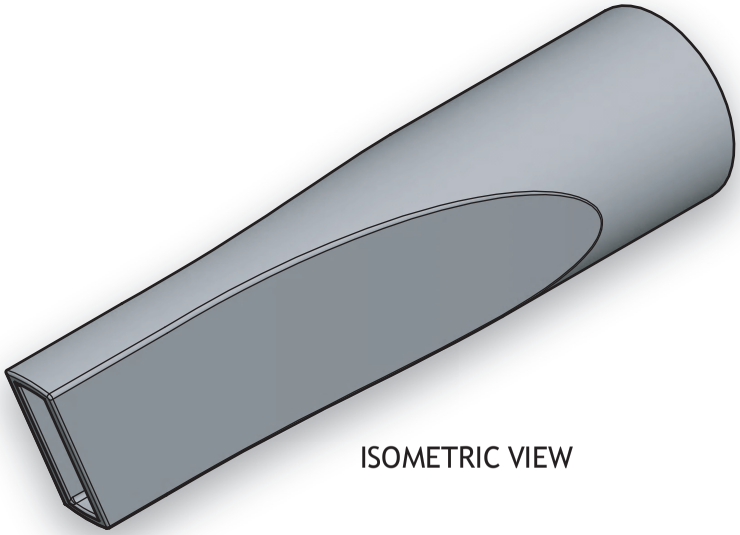

R4
View B



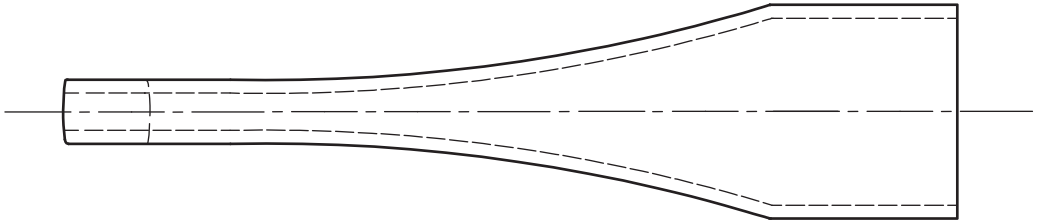
Supplementary Sheet 3 for use with Question 2(b)(i)

NOZZLE 1

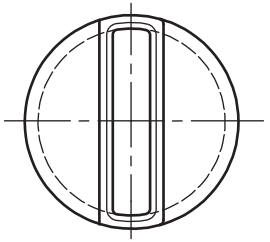
(Hidden detail of the internal fillet has been omitted for clarity.)



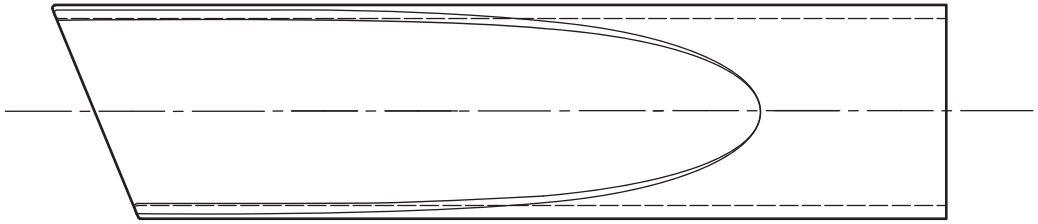
ISOMETRIC VIEW



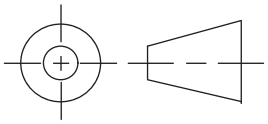
PLAN



END ELEVATION



ELEVATION

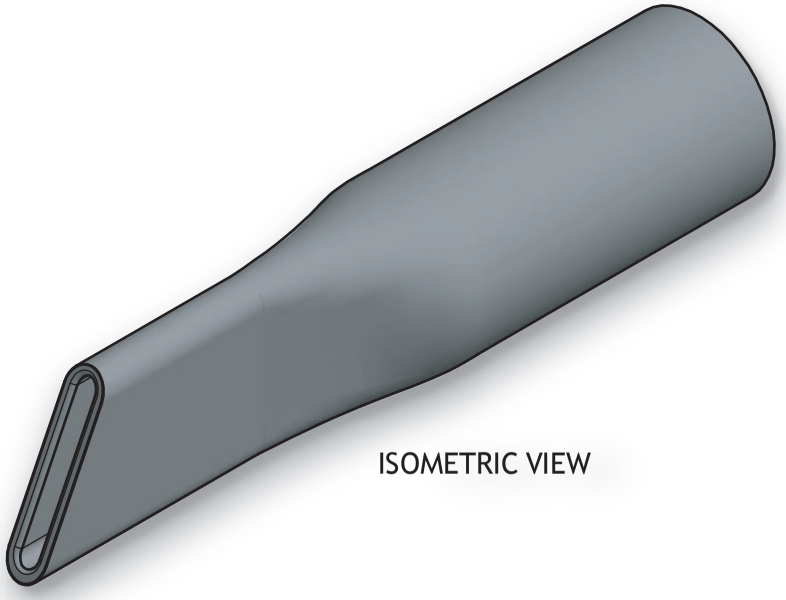


ALL DIMENSIONS IN MM	DESIGNER V. CLEANER	DRAWING NO 1	SCALE 1:1
ORTHOGRAPHIC PART DRAWING	NOZZLE 1	MATERIAL: POLYPROPYLENE	DATE 2016

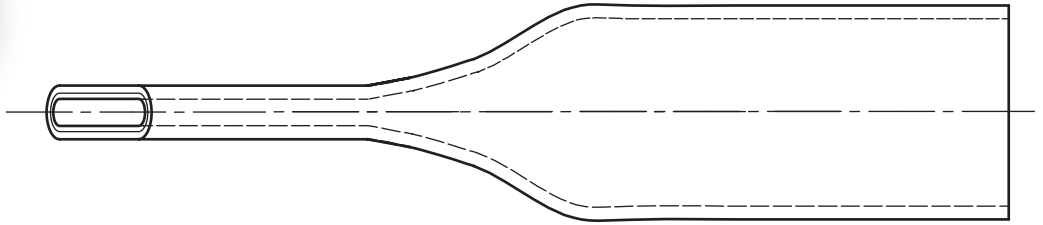
Supplementary Sheet 4 for use with Question 2(b)(ii)

NOZZLE 2

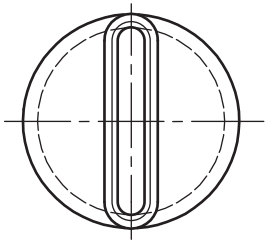
(Hidden detail of the internal fillet has been omitted for clarity.)



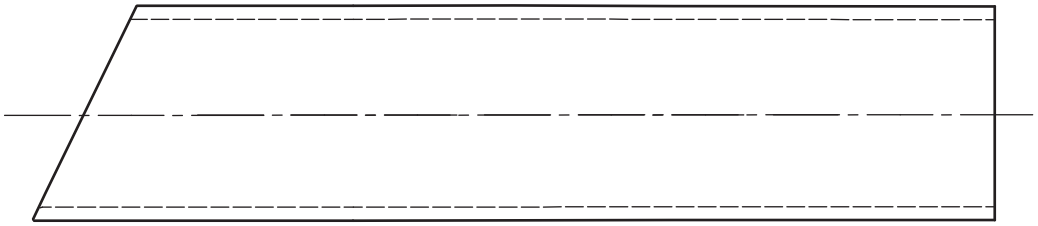
ISOMETRIC VIEW



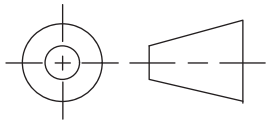
PLAN



END ELEVATION



ELEVATION



ALL DIMENSIONS IN MM	DESIGNER V. CLEANER	DRAWING NO 1	SCALE 1:1
ORTHOGRAPHIC PART DRAWING	NOZZLE 2	MATERIAL: POLYPROPYLENE	DATE 2016

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