Higher Graphic Communication

CAD Question — 16 Marks

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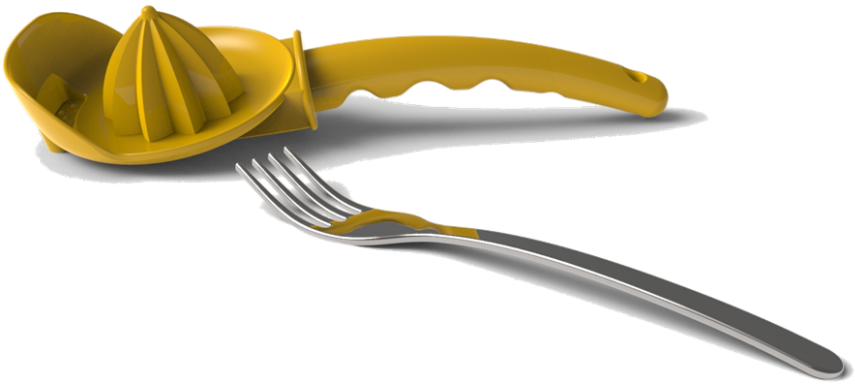
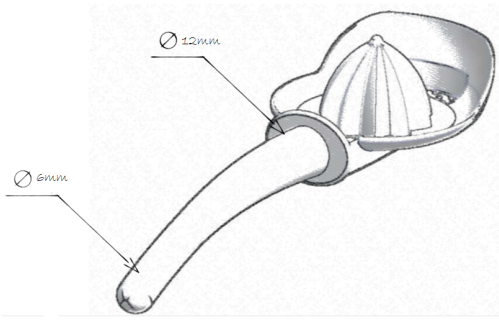
1. The 3D model below shows a new design concept of a lemon juicer. A CAD technician created the 3D model from a series of 2D and 3D sketches.



The handle has been carefully designed to be comfortable and provide good grip for the user. The outside diameter of the handle gradually changes from 6mm at the bottom to 12mm at the top as shown.



(a) Identify an appropriate 3D modeling technique and describe how it would be used to create the handle shown above. You may use sketches to support your answer.

3D modeling technique

2

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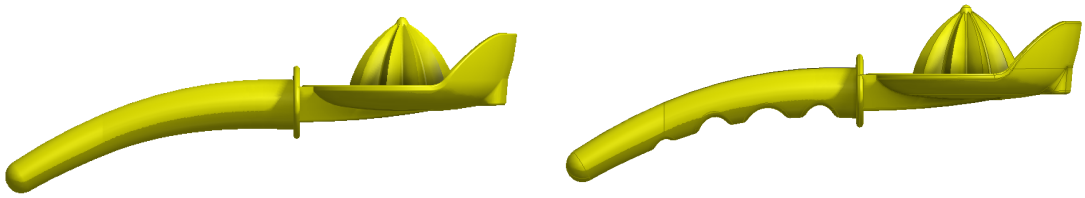
1. Later on in the design process the handle is changed to include curved finger grips to improve the comfort and grip of the handle. The production drawings have to be updated as a result.

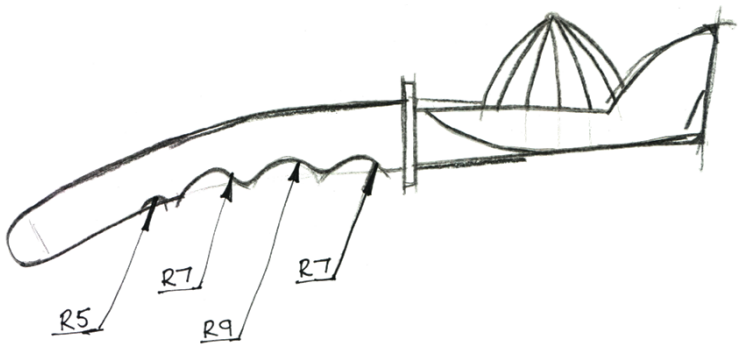
(b) Explain the advantages of CAD when editing work in this way.



1

The sketch below was produced to show the radius of the curves for the finger grips.

(c) Produce a modelling plan which could be used to create The 4 finger grips. You can sketch, annotate, and/or use text in your answer.



2

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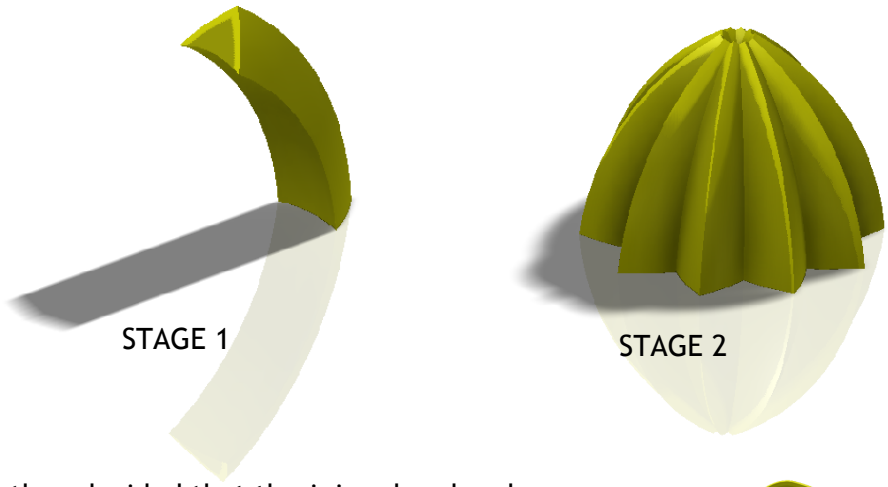
Part of the juicer head 3D model was created in two stages as shown below.

(d) State the name of the 3D modeling tool that was used to create the model at stage 1.

1

(e) State the technique used to create the model at stage 2 and give an advantage of using this method.

2



It was then decided that the juicer head and handle should be manufactured as two separate components.

(f) Describe, using a "top-down" approach, the techniques used to create the two component parts from the solid model. You can sketch, annotate and/or use text in your answer.

4

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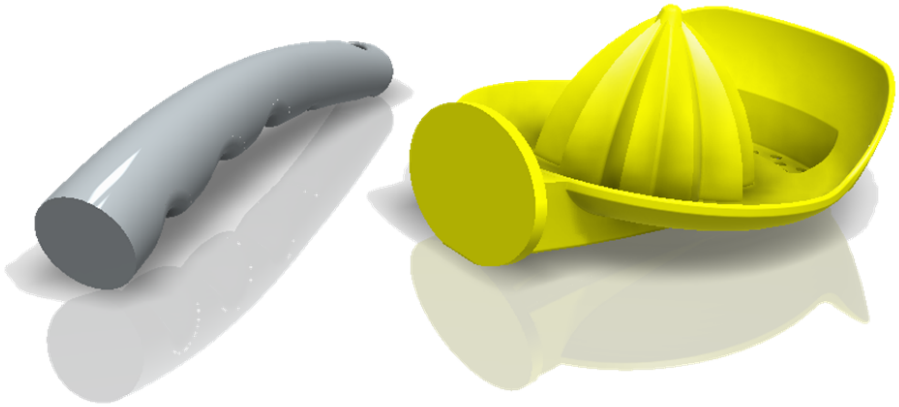
The two parts need to be adapted to allow them to join together easily.



(g) Produce a 3D modelling plan to show how the handle and juicer head can be adapted so that they can be joined together easily. You can sketch, annotate and/or use text in your answer.

4