

**Design & Technology**  
**AQA A-Level**

# Computer aided design (CAD)

## **Materials required for questions**

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- Pencil
- Rubber
- Calculator

## **Instructions**

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- Use black ink or ball-point pen
- Try answer all questions
- Use the space provided to answer questions
- Calculators can be used if necessary
- For the multiple choice questions, circle your answer

## **Advice**

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- Marks for each question are in brackets
- Read each question fully
- Try to answer every question
- Don't spend too much time on one question

**Good luck!**

**Q1.** What is a key disadvantage of using CAD compared to manual drafting?

- A** Limited design complexity
- B** High initial software/hardware costs
- C** High initial software/hardware costs

**Q2.** Which advantage does CAD offer over manual methods for design iteration?

- A** Easier physical sketching
- B** Faster editing and modification
- C** Reduced need for technical skills

**Q3.** What is the primary use of 2D CAD in product development?

- A** Generating technical working drawings with dimensions
- B** Creating photorealistic renderings
- C** Simulating aerodynamic performance

**Q4.** How is 3D CAD typically used for presentation drawings?

- A** Producing exploded views for assembly instructions
- B** Hand-drawn concept sketches
- C** Writing manufacturing specifications



## Answers

Q1. C

Q2. B

Q3. A

Q4. A

Q5.

### CAD Rendering

- Costly software and powerful computer processors are needed which can make it prohibitive.
- A high degree of competency in the use of the CAD software is needed to fully exploit all functions which may require lengthy training.
- Software may require purchased credits to perform high quality renders adding to the cost of the technique.
- Photo realistic renders are feasible.
- A huge range of material textures are available.
- Light sources and shadow can be represented.
- Rendered images can be placed into scenarios.
- CAD can be emailed/shared for instant feedback from clients/focus groups.
- CAD renders can be easily edited.

### Hand rendering

- A great deal of skill is needed to proficiently achieve a high quality render using markers, coloured pencils or inks etc.
- Specialist paper is needed to avoid the colours running.
- A hand rendered drawing can be time consuming to complete and takes longer than CAD.
- Tone and shadow can be achieved through a wide range of available colours.
- Flat smooth colours can be achieved with the use of a blender.
- Minimal specialist equipment is needed making the process more affordable than CAD.
- Hard to edit the render and usually would require restarting.