1.13 CAD and CAM workflow: 10-minute Pack

AQA 8552 · Calculator allowed · about 10 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions.

1 State one difference between a CAD model and CNC manufacture.

(Total for Question 1 is 1 mark)

2 Fictional planning data: a hand-made batch takes 2 minutes per item with no setup. A CNC batch takes 30 minutes setup plus 0.5 minutes per item. Assume both rates are constant, setup is once per batch, and times exclude breaks. Calculate both total times for 10 items and for 100 items, then state which method is faster at each quantity.

(Total for Question 2 is 4 marks)

3 A CNC job file names a material and gives the outside profile, but has no thickness or hole positions. Identify two pieces of information to confirm before production.

(Total for Question 3 is 2 marks)

4 A digital model predicts that a phone stand will hold a 220 g phone at 60 degrees. Explain why a physical prototype test is still useful.

(Total for Question 4 is 2 marks)

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Mark scheme · 1.13 CAD and CAM workflow: 10-minute Pack

Question 1

CAD creates or edits a digital design; CNC uses computer-controlled equipment to make a physical part from instructions. **B1**

Answer: CAD is digital design; CNC is computer-controlled physical manufacture.

Question 2

At 10: hand = 10 x 2 = 20 minutes; CNC = 30 + (10 x 0.5) = 35 minutes. **M1**

At 10, hand is faster. **A1**

At 100: hand = 100 x 2 = 200 minutes; CNC = 30 + (100 x 0.5) = 80 minutes. **M1**

At 100, CNC is faster. **A1**

Answer: 10 items: hand 20 min, CNC 35 min, so hand is faster. 100 items: hand 200 min, CNC 80 min, so CNC is faster.

Question 3

Specify the required thickness. **B1**

Specify hole positions, for example dimensions from a datum or centre coordinates. **B1**

Answer: Thickness and hole locations referenced to a datum must be confirmed.

Question 4

The model is a prediction based on its assumptions and may not capture actual material, build or loading behaviour. **B1**

A controlled physical test can reveal problems such as flexing or tipping under the stated load and angle. **B1**

Answer: A model predicts from assumptions; testing a prototype provides evidence of actual behaviour under the specified conditions.

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