



Surname \_\_\_\_\_

Other Names \_\_\_\_\_

Centre Number \_\_\_\_\_

Candidate Number \_\_\_\_\_

Candidate Signature \_\_\_\_\_

I declare this is my own work.

**A-level**

# **DESIGN AND TECHNOLOGY: PRODUCT DESIGN**

**Paper 2 Designing and Making Principles**

**7552/2**

**Time allowed: 1 hour 30 minutes**

**For this paper you must have:**

- normal writing and drawing instruments
- a scientific calculator.

**At the top of the page, write your surname and other names, your centre number, your candidate number and add your signature.**

**[Turn over]**



J U N 2 2 7 5 5 2 2 0 1

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## INSTRUCTIONS

- Use black ink or black ball-point pen. Use pencil only for drawing.
- Answer ALL questions.
- You must answer the questions in the spaces provided. Do NOT write on blank pages.
- If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).
- Do all rough work in this book. Cross through any work you do not want to be marked.

## INFORMATION

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- There are 30 marks for SECTION A and 50 marks for SECTION B.

**DO NOT TURN OVER UNTIL TOLD TO DO SO**



## SECTION A – PRODUCT ANALYSIS

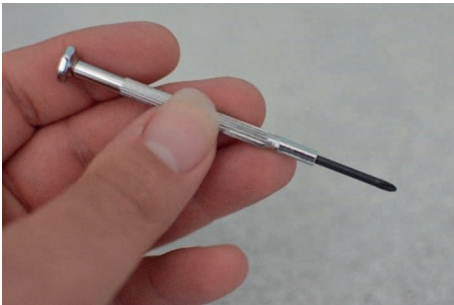
Answer ALL questions in this section.

0	1
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FIGURES 1 and 2 show two screwdrivers.

**FIGURE 1**

**JEWELLER'S  
SCREWDRIVER**



**FIGURE 2**

**GENERAL PURPOSE  
SCREWDRIVER**



	FIGURE 1	FIGURE 2
Handle material(s)	Aluminium	Thermoplastic and elastomer
Handle formed by	Casting	Injection moulding
Screwdriver tip	Fixed tip	Interchangeable magnetic attachment



**Compare the two screwdrivers shown.**

**In your answer you should refer to:**

- ergonomics
- material suitability
- product function.

**[12 marks]**

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[illegible]

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**[Turn over]**



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**Explain how different prototyping methods may be used in the development of a screwdriver handle. [4 marks]**

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A screwdriver handle has a volume of  $55\,000\text{ mm}^3$

The handle is formed from two materials:

MATERIAL	DENSITY	PERCENTAGE OF HANDLE
A	$1.4\text{ g/cm}^3$	85%
B	$1.1\text{ g/cm}^3$	15%

Calculate the mass of the handle in grams. [4 marks]

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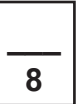


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Answer \_\_\_\_\_ g



[Turn over]



0	4
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## Explain how the Art Deco design style was influenced by:

- **historical design styles**
- **socio-economic factors.**

**[6 marks]**

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0 5

**Outline the concept of eco-labelling AND the impact on customer buying preferences. [4 marks]**

**[Turn over]**



## SECTION B – COMMERCIAL MANUFACTURE

Answer ALL questions in this section.

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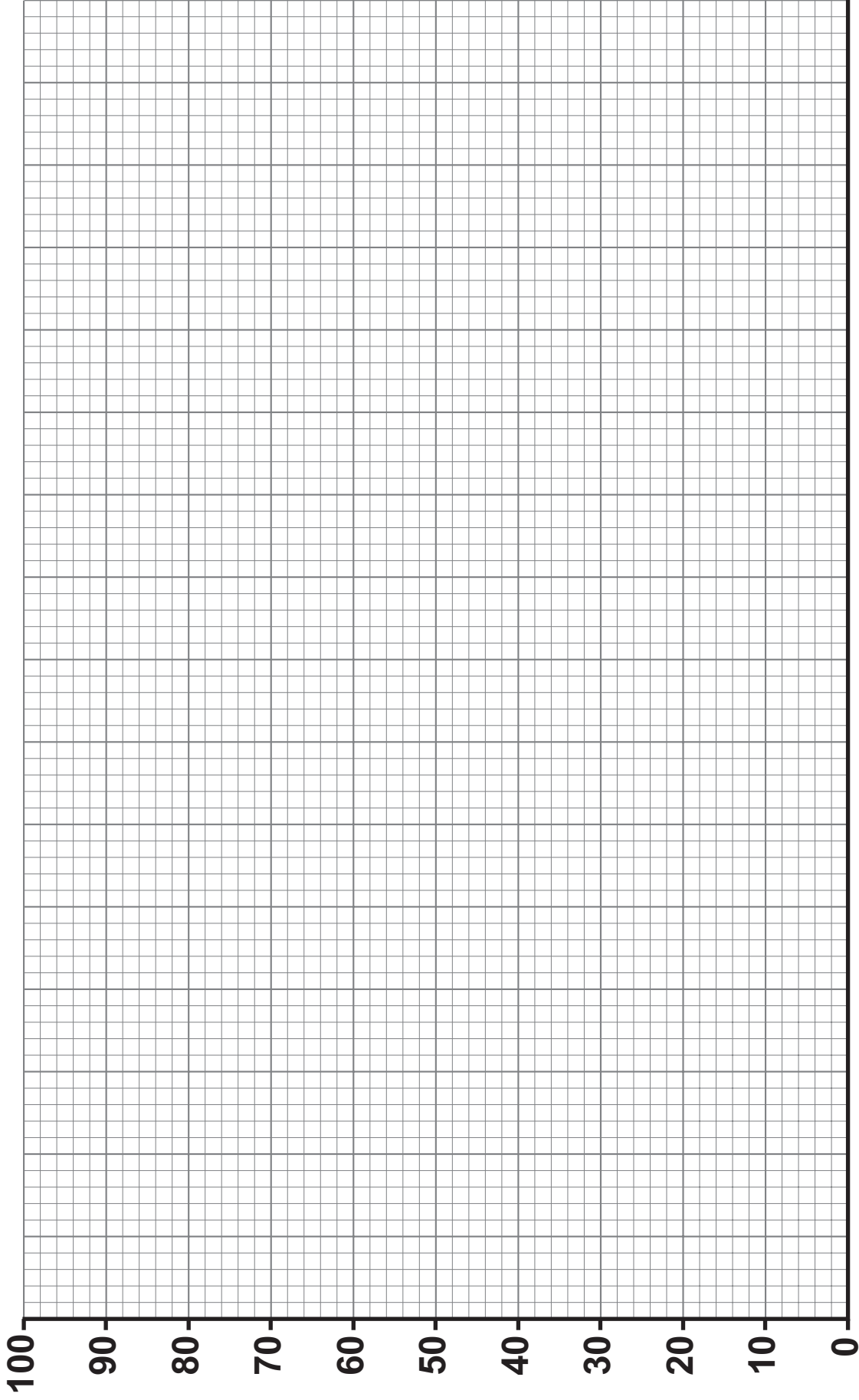
TABLE 1 shows sales of new vehicles from 2016–2019

Plot the data shown in the table to compare % sales of EACH fuel type from 2016–2019 [4 marks]

TABLE 1

YEAR	PETROL	DIESEL	ELECTRIC VEHICLES (ALL TYPES)	TOTAL SALES
2016	1 319 423	1 292 496	80 781	2 692 700
2017	1 371 924	1 067 052	101 624	2 540 600
2018	1 491 273	733 801	142 026	2 367 100
2019	1 502 215	623 997	184 888	2 311 100





[Turn over]



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4

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**Discuss the issues associated with the development of electric vehicles. [6 marks]**

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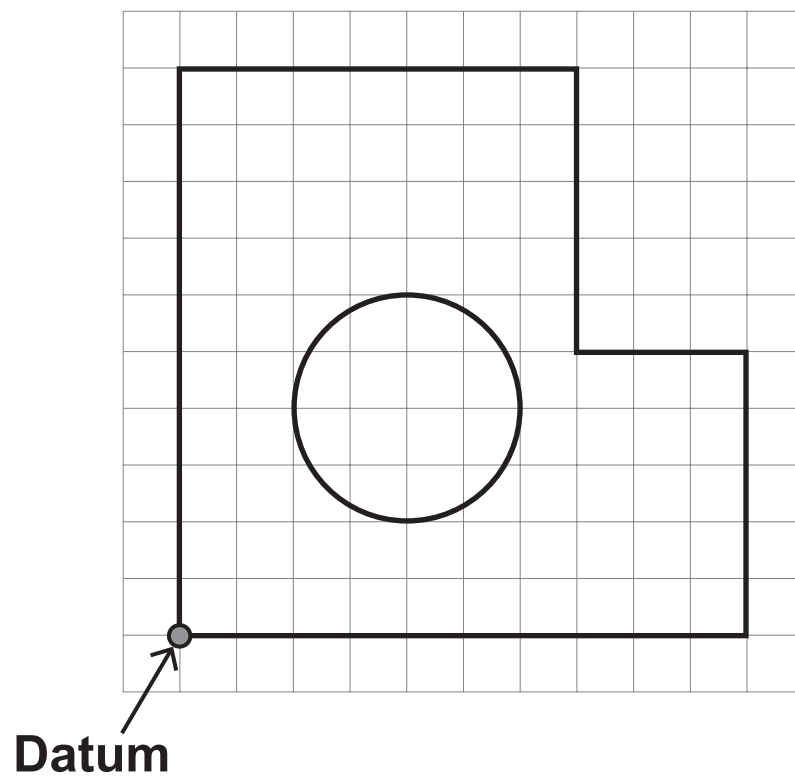
**Fully dimension the drawing shown in FIGURE 3, on the opposite page, to minimise dimensional inaccuracies.**

**Use the grid opposite and the datum labelled in grey for your task.**

**Take each grid square to be 5 mm across. [4 marks]**



FIGURE 3



[Turn over]



0	9
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**Outline the ways a design team can reduce the time from idea conception to product release. [6 marks]**

[illegible]

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**State FOUR of Dieter Rams' principles of good design.  
[4 marks]**

1 

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2 

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**[Turn over]**



1	1
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**Explain why utility furniture was introduced after the Second World War. [4 marks]**

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$\frac{\quad}{4}$



1	2
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**State TWO stages found on a product life cycle graph.**  
**[2 marks]**

**1** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**2** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2
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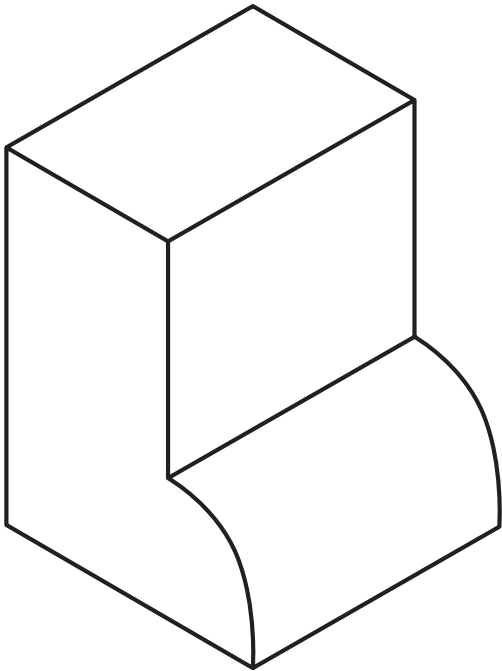


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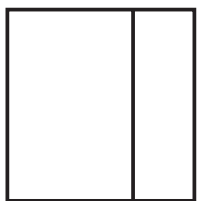
**FIGURES 4 and 5 show TWO different drawing types.**

**State the drawing type used in EACH figure. [2 marks]**

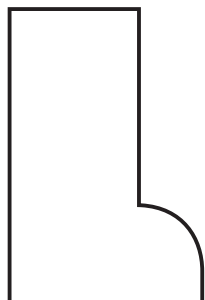
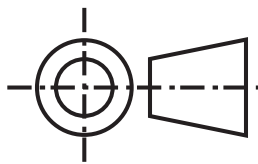
**FIGURE 4**



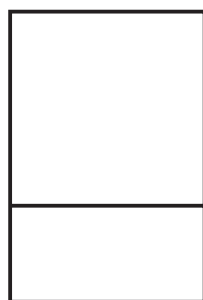
**FIGURE 5**



**Plan view**



**Front view**



**Side view**





**FIGURE 4** \_\_\_\_\_

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**FIGURE 5** \_\_\_\_\_

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\_\_\_\_\_

2

1

4

**Name TWO primary research methods. [2 marks]**

**1** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**2** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2

**[Turn over]**



1 5

**FIGURES 6 and 7 show two mobility aids used to increase stability when standing and walking.**

**FIGURE 6****FIGURE 7**

	<b>FIGURE 6</b>	<b>FIGURE 7</b>
<b>Frame material</b>	<b>Aluminium tube</b>	<b>Aluminium casting</b>
<b>Braking</b>	<b>None</b>	<b>Cable brakes with lever</b>
<b>Height adjustment</b>	<b>Telescopic tube and press button</b>	<b>None</b>



**Compare the suitability of the mobility aids for use around the home and garden. [6 marks]**

[illegible]

**[Turn over]**



1	6
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**FIGURE 8** shows a water pump used in an isolated village.

## **FIGURE 8**

The image shows a man, two women and a child using a water pump. The man holds a lever on the pump and the women hold their hands under the water.



FEATURE	DESCRIPTION
Power	Hand-operated mechanical pump
Fabrication	Standardised nuts and bolts
Material	Low-carbon steel sheet
Design	Open-sourced
Finish	Galvanising



**Analyse and evaluate the suitability of the water pump design for this isolated village. [6 marks]**

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6

**[Turn over]**



1	7
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**Explain the impact of a product recall on a manufacturer of electrical goods. [4 marks]**

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4

## END OF QUESTIONS



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**Additional page, if required.**

**Write the question numbers in the left-hand margin.**

[illegible]



**Additional page, if required.**

**Write the question numbers in the left-hand margin.**

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For Examiner's Use	
Question	Mark
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<b>TOTAL</b>	

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