Design & Technology

Mathematics for D&T – Ratio

Materials required for questions

- Pencil
- Rubber
- Calculator

Instructions

- Use black ink or ball-point pen
- Try answer all questions
- Use the space provided to answer questions
- Calculators can be used if necessary

Advice

- 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. A screwdriver has a volume of 32,000mm^3. The handle is formed of 2 materials:

Material	Density	Percentage of handle
A	1.3g/mm^3	70%
B	1.5g/mm^3	30%

Calculate the mass of the handle in grams **(4 marks)**

Q2. A manufacturer is producing a concrete mix for a new building. The building requires 4 concrete beams, each 1.2m x 2m x 5m. The cement is mixed with water in a 2:4 water to cement ratio. How much water is needed for the building? **(4 marks)**

Q3. A plank of wood is to be cut in a ratio of 2:1:5. The plank is 2m long. Calculate the length of the longest piece **(2 marks)**

Q4. The ratio of resin to hardener for an adhesive is 4:5. If the volume of hardener is $4cm^3$. What is the total volume of the adhesive when mixed **(3 marks)**

Q5. Copper costs £4 per kg. Zinc costs £3.10 per kg. Copper and zinc are mixed in the ratio 4:1 to make brass. Work out the cost of 7 kilograms of brass. **(3 marks)**

Q6. A bag contains nuts and bolts in the ratio 1:3 There are 8 more bolts than nuts. How many nuts are there **(3 marks)**

Answers

Q1.
43,520 grams

Q2.
Volume = 48m^3
Water needed = 16m^3

Q3.
1.25m

Q4.
7.2cm^3

Q5.
5.6kg Copper x 4 = 22.4
1.4kg Zinc x 3.10 = 4.34
Total = £26.74

Q6.
4 nuts and 12 bolts