



Compound measures

About 40 minutes Calculator allowed 37 marks

Date _____

A Do Now

The first question is what today's lesson needs. The others bring back earlier topics.

- A1** Needed today [2 marks]

Work out the total of 3.05 hours and 1 hour 35 minutes. Give your answer in hours and minutes.

A2 Last lesson [2 marks]

Dan and Ella share their savings in the ratio 7 : 11. Ella gets £40 more than Dan. How much do they share altogether?

Answer

Answer

- A3** From chapter 3 [2 marks]

The line of best fit for minutes of exercise (x) and calories used (y) has equation $y = -2x + 40$. Estimate x when $y = 28$.

A4 Key Stage 3 [2 marks]

80% of 20 is equal to 50% of B . Find B .

Answer

Answer

B Example, then your turn

Your teacher works through each example with you. Then try the one beside it.

EXAMPLE 1

A cyclist rides 33 km at an average speed of 12 km/h. How long does the ride take? Give your answer in hours and minutes.

Hint Time = distance $\div$ speed. Then turn the decimal part of an hour into minutes.

- B1** A coach travels 189 km at an average speed of 54 km/h. How long does the journey take? Give your answer in hours and minutes. [2 marks]

Answer hours minutes

EXAMPLE 2

A block of metal has a mass of 702 g and a volume of 90 cm^3 . Work out its density.

Hint Density = mass $\div$ volume.

B2 A piece of glass has a mass of 375 g and a volume of 150 cm^3 . Work out its density. [2 marks]

Answer

c Practice

C1 A train travels 95 km in 1 hour 15 minutes. Work out its average speed in km/h. [2 marks]

Answer

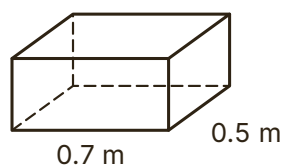
C2 Write a speed of 12 m/s in km/h. [2 marks]

Answer

C3 Aluminium has a density of 2.7 g/cm^3 . Work out the mass of 250 cm^3 of aluminium. [2 marks]

Answer

C4 A crate weighs 840 N. It stands on the floor on its base, which is 0.7 m by 0.5 m. Work out the pressure on the floor, in N/m^2 . [2 marks]



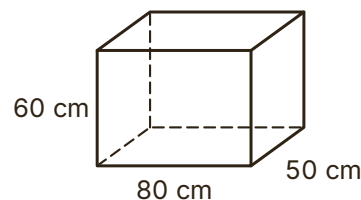
Not drawn accurately

Answer

C5 150 cm^3 of a metal with density 8 g/cm^3 is melted together with 250 cm^3 of a metal with density 4 g/cm^3 . Work out the density of the mixture. [3 marks]

Answer

C6 A tank is a cuboid. Water flows in at 12 litres per minute. How many minutes does it take to fill the empty tank? (1 litre = 1000 cm^3) [3 marks]



Not drawn accurately

Answer

D Exam-style questions

D1 Kai says, "A journey of 2.3 hours takes 2 hours 30 minutes." [2 marks]

Explain why Kai is wrong, and give the correct time in hours and minutes.

D2 Ana leaves home at 08:50. She drives 150 km at an average speed of 60 km/h, stops for 40 minutes, then drives a further 90 km at an average speed of 45 km/h.

(a) Work out the time she arrives. [3 marks]

Answer

(b) Work out her average speed for the whole trip, including the stop. Give your answer to 1 decimal place. [3 marks]

Answer

Total for D2: 6 marks

E Extension

No route is given. The hints are at the end of the sheet. Use one at a time.

E1 A solid cube is made of metal with a density of 8 g/cm^3 . It stands on the floor and exerts a pressure of 4000 N/m^2 . Take the force to be 10 N for each kilogram of mass. Work out the length of a side of the cube. [3 marks]

Answer

Extension hints

Cover these with paper. Uncover one at a time.

- E1** **Hint 1** Call the side x cm. Write the mass, the force and the area of the base in terms of x .
- Hint 2** Mass = $8x^3 \text{ g} = 0.008x^3 \text{ kg}$, so the force is $0.08x^3 \text{ N}$. The base is $x^2 \text{ cm}^2$, which is $\frac{x^2}{10\,000} \text{ m}^2$.
- Hint 3** Pressure = $0.08x^3 \times \frac{10\,000}{x^2} = 800x$. So $800x = 4000$ and $x = 5 \text{ cm}$.

How did it go?

Colour one circle on each line: not yet, nearly, yes.

I can use speed, distance and time, and write a time in hours and minutes. ○ ○ ○

I can use density and pressure, and change between units. ○ ○ ○