Significant figures in calculations

Science maths skills | AQA Combined Science 8464 and the separate sciences | 13 questions, 41 marks

GCSE science calculations

Scan for the solutions

Equations for this topic (cover this box to practise recalling them)

- potential difference = current × resistance learn this one
- kinetic energy = 0.5 × mass × (speed)^2 learn this one
- density = $\frac{\text{mass}}{\text{volume}}$ learn this one
- energy transferred = power × time learn this one
- acceleration = $\frac{\text{change in velocity}}{\text{time taken}}$ learn this one
- distance travelled = speed × time learn this one
- gravitational potential energy = mass × gravitational field strength × height learn this one
- efficiency = $\frac{\text{useful output energy transfer}}{\text{total input energy transfer}}$ learn this one

Name: _____ **Date:** _____ **Score:** _____ **/ 41**

1 Round each value to the number of significant figures given.

a. A current of 0.04672 A, to 2 significant figures.

b. An energy of 38 650 J, to 3 significant figures.

(2 marks)

Answer _____

2 Callum uses a stopwatch and a micrometer in a lab practical.

a. He times a trolley at 12.348 s. Round this to 3 significant figures.

b. He measures the diameter of a wire as 0.0009058 m. Round this to 2 significant figures.

(2 marks)

Answer _____

3 The current through a 47 Ω resistor is 0.35 A.

Calculate the potential difference across the resistor. Give your answer to 2 significant figures.

(2 marks)

Answer _____

Free for classroom and home use: print, photocopy and share. Not for resale or re-hosting.

4 A tennis ball of mass 58 g is served at a speed of 23 m/s.

Calculate the kinetic energy of the ball. Give your answer to 2 significant figures.

(3 marks)

Answer _____

5 Grace measures a brass weight. Its mass is 264 g and its volume is 31.0 cm^3.

1 $cm^3 = 1 \times 10^{-6}$ m^3

Calculate the density of the brass in kg/m^3. Give your answer to an appropriate number of significant figures.

(3 marks)

Answer _____

6 A 5.0 W phone charger is used for 47 minutes.

Calculate the energy transferred by the charger. Give your answer to 2 significant figures.

(3 marks)

Answer _____

7 A lamp has a potential difference of 6.0 V across it. The current through the lamp is 0.28 A.

Calculate the resistance of the lamp. Give your answer to 2 significant figures.

(3 marks)

Answer _____

8 A hand dryer has a power of 1.3 kW. It transfers 45 kJ of energy to dry Priya's hands.

Calculate how long the hand dryer is on for. Give your answer to 2 significant figures.

(3 marks)

Answer _____

Free for classroom and home use: print, photocopy and share. Not for resale or re-hosting.

9 A cyclist speeds up from 4.0 m/s to 13 m/s. Her acceleration is 2.4 m/s^2.

Calculate the time taken. Give your answer to 2 significant figures.

(3 marks)

Answer _____

10 A football of mass 0.45 kg rolls 26 m across a pitch in 4.5 s at a constant speed.

a. Calculate the kinetic energy of the football. Give your answer to 2 significant figures.

b. Ryan rounded the speed to 5.8 m/s before working out the kinetic energy. He got 7.6 J. Explain why his answer is different from yours.

Show your working.

(4 marks)

Answer _____

11 **Higher tier**

Zainab drops a 0.65 kg ball from a height of 2.3 m. Gravitational field strength = 9.8 N/kg.

Assume all the gravitational potential energy of the ball is transferred to kinetic energy.

Calculate the speed of the ball just before it hits the ground. Give your answer to 2 significant figures.

Show your working.

(5 marks)

Answer _____

Free for classroom and home use: print, photocopy and share. Not for resale or re-hosting.

12 A motor on a building site lifts a 12 kg bucket of sand through a height of 3.5 m. The motor has an input power of 25 W and takes 24 s to lift the bucket.

Gravitational field strength = 9.8 N/kg.

Calculate the efficiency of the motor. Give your answer as a percentage to 2 significant figures.

Show your working.

(5 marks)

Answer _____

13 Femi connects a resistor and a lamp in series to a 6.0 V supply. The potential difference across the resistor is 4.6 V. The current in the circuit is 0.38 A.

Calculate the resistance of the resistor. Give your answer to 2 significant figures.

(3 marks)

Answer _____

End of questions | Total 41 marks

Free for classroom and home use: print, photocopy and share. Not for resale or re-hosting.