

Hours, Minutes and Seconds: From Decimals to Problem Solving (Answers)

Westies Workshop · GCSE Number 2.3 Calculator Techniques

Section A: Basic conversions

1. Write 3.5 hours in hours and minutes.
3 hours 30 minutes
2. Write 2.25 hours in hours and minutes.
2 hours 15 minutes
3. Write 1.8 hours in hours and minutes.
1 hour 48 minutes
4. Write 6.4 minutes in minutes and seconds.
6 minutes 24 seconds
5. Write 2 hours 45 minutes as a decimal number of hours.
2.75 hours
6. Write 3 minutes 27 seconds as a decimal number of minutes.
3.45 minutes
7. How many minutes are there in 2.65 hours?
159 minutes
8. Use the ° ' " button to write 3.7375 hours in hours, minutes and seconds.
3 hours 44 minutes 15 seconds
9. Use the ° ' " button to write 1.2575 hours in hours, minutes and seconds.
1 hour 15 minutes 27 seconds
10. Use the ° ' " button to write 0.0725 hours in minutes and seconds.
4 minutes 21 seconds
11. Write 5 hours 13 minutes 48 seconds as a decimal number of hours.
5.23 hours
12. Write 2.4175 minutes in minutes and seconds, to the nearest second.
2 minutes 25 seconds (2 minutes 25.05 seconds)

Section B: Problem solving

1. Journey (speed, distance, time)

A coach travels 200 km at an average speed of 76 km/h. It leaves at 09:50.

- (a) How long does the journey take? Give your answer in hours, minutes and seconds, to the nearest second.
- (b) At what time does it arrive, to the nearest minute?

(a) $200 \div 76 = 2.6315\dots$ hours = 2 hours 37 minutes 54 seconds

(b) $09:50 + 2 \text{ h } 37 \text{ min } 54 \text{ s} = 12:27:54$, so 12:28

2. Earnings (money)

Maya is paid £10.42 per hour. One week she earns £86.

How long did she work? Give your answer in hours and minutes, to the nearest minute.

$86 \div 10.42 = 8.2533\dots$ hours = 8 hours 15 minutes 12 seconds, so 8 hours 15 minutes

3. Filling a tank (volume and units)

A fish tank is a cuboid 80 cm long, 50 cm wide and 60 cm high. It is filled with water at 4.7 litres per minute.

How long does it take to fill the tank? Give your answer in minutes and seconds, to the nearest second. (1 litre = 1000 cm³)

Volume = $80 \times 50 \times 60 = 240\,000 \text{ cm}^3 = 240 \text{ litres}$

$240 \div 4.7 = 51.0638\dots$ minutes = 51 minutes 4 seconds

4. Phone battery (percentages)

A phone battery charges at 1.7% per minute. It is at 24% now.

How long will it take to reach 100%? Give your answer in minutes and seconds, to the nearest second.

$76 \div 1.7 = 44.7058\dots$ minutes = 44 minutes 42 seconds

5. Sharing the driving (ratio)

Ali and Ben share 6.3 hours of driving in the ratio 3 : 4.

How long does each of them drive? Give your answers in hours and minutes.

$6.3 \div 7 = 0.9$ hours per part

Ali 2.7 hours = 2 hours 42 minutes, Ben 3.6 hours = 3 hours 36 minutes

6. Light from the Sun (standard form)

The Sun is 1.496×10^8 km from the Earth. Light travels at 2.998×10^5 km per second.

How long does light from the Sun take to reach the Earth? Give your answer in minutes and seconds, to the nearest second.

$1.496 \times 10^8 \div (2.998 \times 10^5) = 498.99\dots$ seconds ≈ 499 seconds = 8 minutes 19 seconds

7. Cross-country (averages)

Four runners finish a race in 12.4, 13.05, 11.8 and 12.83 minutes.

Work out their mean time in minutes and seconds.

$(12.4 + 13.05 + 11.8 + 12.83) \div 4 = 50.08 \div 4 = 12.52$ minutes = 12 minutes 31.2 seconds

8. Cooking a turkey (proportion)

A turkey needs 25 minutes per 500 g plus an extra 20 minutes. A turkey weighs 4.35 kg and goes in the oven at 10:45.

(a) How long does it cook, in hours, minutes and seconds?

(b) At what time will it be ready?

(a) $4350 \div 500 = 8.7$, $8.7 \times 25 + 20 = 237.5$ minutes = 3 hours 57 minutes 30 seconds

(b) 14:42:30

9. A long film (fractions)

A film lasts $2\frac{3}{4}$ hours. Jo has watched $\frac{3}{7}$ of it.

How much of the film is left? Give your answer in hours, minutes and seconds, to the nearest second.

$\frac{4}{7} \times 2.75 = 1.5714\dots$ hours = 1 hour 34 minutes 17 seconds

10. Walking to school (speed, units)

Kim walks 3.8 km to school at 4.6 km/h.

How long does the walk take? Give your answer in minutes and seconds, to the nearest second.

$3.8 \div 4.6 = 0.8260\dots$ hours = 49 minutes 34 seconds

11. Drone flight (Pythagoras)

► Check with your teacher that you have covered Pythagoras before trying this one.

A drone flies in a straight line from one corner of a rectangular field to the opposite corner. The field is 125 m by 84 m. The drone flies at 2.4 m/s.

How long does the flight take? Give your answer in minutes and seconds, to 1 decimal place of a second.

Diagonal = $\sqrt{(125^2 + 84^2)} = \sqrt{22\,681} = 150.60\dots$ m

$150.60\dots \div 2.4 = 62.75\dots$ seconds = 1 minute 2.8 seconds

12. A faster train (reverse percentages)

► Check with your teacher that you have covered reverse percentages before trying this one.

After a 15% increase in speed, a train journey takes 2 hours 15 minutes.

How long did the journey take before the increase? Give your answer in hours, minutes and seconds.

Time is inversely proportional to speed: $2.25 \times 1.15 = 2.5875$ hours = 2 hours 35 minutes 15 seconds

Section C: Think about it

1. Spot the mistake

Sam says, "1.5 hours is 1 hour 50 minutes."

Explain Sam's mistake and give the correct time.

0.5 hours is half of 60 minutes, so 1.5 hours = 1 hour 30 minutes. Sam treated the decimal part as minutes.

2. Which is longer?

Which is longer: 2.4 hours or 2 hours 25 minutes? Show your working.

2.4 hours = 2 hours 24 minutes, so 2 hours 25 minutes is longer (by 1 minute).