

C1.14 Using a calculator

Name: _____ Class: _____ Date: _____ **Total: 20 marks**

KEY WORDS decimal 小数 • significant figure 有效数字 • rate 比率
• order of operations 运算顺序 • decimal place 小数位

Objective

Use using a calculator to solve Core IGCSE Mathematics problems.

You must be able to:

- Enter bracketed calculations accurately
- Retain intermediate calculator precision
- Round only the final answer and convert decimal hours

1 Key knowledge and worked examples

■ Key knowledge: Using a calculator

Enter a fraction with brackets around the whole numerator and denominator. Check the order of operations and whether the angle mode is degrees. Keep all digits during a multi-step calculation; use the previous-answer key or memory. A display must be interpreted in context: 4.8 yuan means 4.80 yuan, while 3.25 hours means 3 hours 15 minutes.

■ Worked example: Using a calculator

2 h 45 min	45 / 60 h	2.75 h
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Evaluate $(7.2 + 1.8)/(4.1 - 1.6)$.

- Enter $(7.2+1.8)/(4.1-1.6)$ so both grouped expressions stay together.
- $Q = (7.2 + 1.8)/(4.1 - 1.6) = 9/2.5 = 3.6$.
- Convert 2 hours 45 minutes before a rate calculation: $t = 2 + 45/60 = 2.75$ h.
- Convert 2.4 h back: $m = 0.4 \times 60 = 24$ min, giving 2 h 24 min.

■ Method check

A calculator display is not an instruction to round every intermediate value. Store a value or use the full expression in the next calculation.

2 Practice

2.1 Calculate $(8.4 - 2.1)/(1.2 + 0.3)$. [2]

2.2 Write 1 hour 48 minutes as a decimal number of hours. [2]

2.3 A display says 3.75 hours. Express this in hours and minutes. [2]

2.4 A money calculation displays 6.4 yuan. Write it to the nearest fen. [2]

3 Exam-style questions

3.1 Apply the using a calculator methods below. Show working and include units where appropriate.

(a) Calculate $\sqrt{37}$ and state why its full display should be retained for the next part. [2]

(b) Calculate $20\sqrt{37}$ to three significant figures. [2]

(c) A journey time is 2.35 hours. Express it as hours and minutes. [2]

3.2 A calculator task uses $L = 7\sqrt{29}$.

(a) Calculate L to three significant figures. Explain why first rounding the square root to a whole number is inappropriate. [3]

(b) A journey lasts 1.85 hours. Give its duration in hours and minutes. Explain why the minutes are not 85. [3]

Solutions

Award method and answer marks as indicated; accept equivalent correct methods.

2.1

- Bracket each part: $Q = 6.3/1.5 = \mathbf{4.2}$.

2.2

- $t = 1 + 48/60 = \mathbf{1.8}$ h.

2.3

- The decimal part gives $m = 0.75 \times 60 = 45$: **3 h 45 min**.

2.4

- Two decimal places are needed: **6.40 yuan**.

3.1

(a)

- $r = \sqrt{37} = 6.082762530 \dots$; **retain the digits to avoid rounding error**.

(b)

- $Q = 20\sqrt{37} = 121.6552506 \dots$, so **122** to three significant figures.

(c)

- $m = 0.35 \times 60 = 21$; **2 h 21 min**.

3.2

(a)

- Keep the full root in $L = 7\sqrt{29}$.
- $L \approx 37.6962$, giving **37.7**.
- Early rounding changes the calculation to $7(5) = 35$ and loses the requested accuracy.

(b)

- Minutes use $m = 60(0.85)$, so the duration is **1 h 51 min**.
- Decimal hours are fractions of 60 minutes, not hundredths of a 100-minute hour.