

C1.5 Ordering

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

KEY WORDS fraction • mixed number • decimal • denominator • integer

Objective

Use ordering to solve Core IGCSE Mathematics problems.

You must be able to:

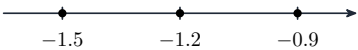
- Order signed numbers and unlike numerical forms
- Use comparison symbols including equality
- Interpret thresholds in a real context

1 Key knowledge and worked examples

■ Key knowledge: Ordering

To order numbers, compare them in the same form. A number further right on a number line is greater. For negative numbers, a larger size can mean a smaller value: $-8 < -3$. $\leq$ and $\geq$ include equality; $<$ and $>$ do not. $\neq$ means not equal.

■ Worked example: Ordering



Order -1.2 , $-1\frac{1}{2}$, -0.9 from smallest to largest.

- Convert the mixed number: $-1\frac{1}{2} = -1.5$.
- Compare positions: $-1.5 < -1.2 < -0.9$.
- For positive fractions, compare common denominators: $2/3 = 8/12 < 9/12 = 3/4$.

■ Method check

Compare values rather than the number of written digits. For negative numbers, the value closer to zero is greater.

2 Practice

2.1 Order $-7, 2, -3, 0$ from smallest to largest. [2]

2.2 Insert $<$, $>$ or $=$ between $3/5$ and 0.62 . [2]

2.3 Order $0.48, 45\%, 1/2$ from smallest to largest. [2]

2.4 Write all integers satisfying $-2 \leq x < 3$. [2]

3 Exam-style questions

3.1 Apply the ordering methods below. Show working and include units where appropriate.

(a) Order the race times $12.08, 12.8, 12.18$ s from fastest to slowest. [2]

(b) A qualifying time must be at most 12.18 s. Write this condition using a symbol. [2]

(c) Which of these runners qualify? Explain why equality matters. [2]

3.2 Four freezer readings are $-2.05, -2.5, -2.15, -2.005$ °C. The acceptable range is $-2.5 \leq T \leq -2.05$.

(a) Order the readings from coldest to warmest and identify the warmest reading. [3]

(b) State which readings are acceptable and explain whether -2.5 °C is included. [3]

Solutions

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

2.1

- Left to right on the number line: $-7, -3, 0, 2$.

2.2

- $3/5 = 0.60$, so $3/5 < 0.62$.

2.3

- Convert to decimals 0.48, 0.45, 0.50: 45%, 0.48, $1/2$.

2.4

- Include -2 but exclude 3: $-2, -1, 0, 1, 2$.

3.1

(a)

- Smaller time is faster: **12.08 s, 12.18 s, 12.8 s**.

(b)

- At most includes the boundary: $t \leq 12.18$ (time in seconds).

(c)

- **The 12.08 s and 12.18 s runners qualify;** $\leq$ includes the exact limit.

3.2

(a)

- Use equal decimal places to compare.
- Coldest to warmest: **-2.5 , -2.15 , -2.05 , -2.005 °C**.
- The warmest is **-2.005 °C**, nearest to zero.

(b)

- Accept **-2.5 , -2.15 and -2.05 °C**.
- Reject **-2.005 °C**, which is greater than -2.05 °C.
- The lower endpoint -2.5 °C is included because the symbol is $\leq$.