

Chapter 2 Summary and Review

Integers, Rational Numbers and Real Numbers

Integers

Number line: -4, -3, -2, -1, 0, 1, 2, 3, 4

Key ideas

- Positive and negative integers
- Compare and order integers
- Use a number line
- Real-life situations (e.g. elevator)

Integer operations

Same signs → positive

$(+) \times (+) = +$
 $(-) \times (-) = +$

Different signs → negative

$(+) \times (-) = -$
 $(-) \times (+) = -$

Multiply
 Use sign rules. Then multiply the numbers.

Divide
 Use sign rules. Then divide the numbers.

Combined operations

- Brackets first**
Simplify inside brackets.
- Multiply or divide**
Work from left to right.
- Add or minus**
Work from left to right.

Example: $-3 + 4 \times (-2)$
 $4 \times (-2) = -8$
 $-3 + (-8) = -11$

Fractions and mixed numbers

Key ideas:

- Equivalent fractions
- Simplify fractions
- Convert mixed numbers
- Compare and order fractions

Decimals

0.25, 1.5, 2.75

Key ideas

- Write and read decimals
- Convert between fractions and decimals
- Compare and order decimals
- Terminating and recurring decimals

Chapter 2 Summary and Review

- ✓ Negative numbers
- ✓ Integer operations ($\times$ and $\div$)
- ✓ Combined operations
- ✓ Fractions and mixed numbers
- ✓ Decimals
- ✓ Rational, irrational and real numbers
- ✓ Solve mixed questions
- ✓ Avoid common mistakes
- ✓ Be confident for tests

Rational, irrational and real numbers

Real numbers R

Rational numbers Q

Integers: $\dots, -2, -1, 0, 1, 2, \dots$
 Fractions: $\frac{1}{2}, \frac{3}{4}, \dots$
 Decimals: $0.25, 1.5, 2.75, \dots$

Irrational numbers
 $\sqrt{2}, \pi, \dots$

Key ideas

- Integers are rational numbers.
- Rational numbers can be written as a fraction of two integers (denominator $\neq 0$).
- Irrational numbers cannot be written as a fraction of two integers.
- All rational and irrational numbers are real numbers.

Use this review after completing the Chapter 2 practice pages.

- Review negative numbers, integers and number lines.
- Revise integer operations, including multiplication, division and combined operations.
- Practise fractions, mixed numbers and decimals.
- Classify rational, irrational and real numbers.
- Check common mistakes before attempting the review questions.

Name: _____ Class: _____ Date: _____

1. Chapter 2 Key Ideas Checklist

Skill	Can I do this?	Quick reminder
Negative numbers	☐ Yes ☐ Need practice	Numbers below 0 can represent basement floors, loss, debt or temperature below zero.
Compare integers	☐ Yes ☐ Need practice	Numbers to the right on the number line are greater.
Add and minus integers	☐ Yes ☐ Need practice	Use movement: add can move up/right; minus can move down/left.
Multiply and divide integers	☐ Yes ☐ Need practice	Same signs give positive; different signs give negative.
Combined operations	☐ Yes ☐ Need practice	Brackets first, then multiply/divide, then add/minus.
Fractions and decimals	☐ Yes ☐ Need practice	Convert and simplify when needed.
Real numbers	☐ Yes ☐ Need practice	Real numbers include rational and irrational numbers.

Revision tip

Do not rush to calculate. First identify the topic: number line, integer operation, fraction/decimal conversion, or number classification.

2. Integer Operations Review

Integer questions often test whether students can handle direction, signs and operation order.

Operation	Rule	Example
Compare integers	Use the number line.	-2 is greater than -6 because -2 is to the right.
Add negative numbers	Move left/down when adding a negative number.	$5 + (-8) = -3$
Minus from a negative number	Minus means move down/left.	$-7 - 5 = -12$
Multiply / divide	Same signs $\rightarrow$ positive. Different signs $\rightarrow$ negative.	$-6 \times -4 = 24$, $18 \div -3 = -6$

Worked Examples

Example 1

Evaluate: -4×7

Different signs $\rightarrow$ negative. $4 \times 7 = 28$, so $-4 \times 7 = -28$.

Example 2

Evaluate: $20 \div (-5) - 3$

Do division first. $20 \div (-5) = -4$. Then $-4 - 3 = -7$.

Example 3

Evaluate: $-2 \times (-6 + 1)$

Brackets first: $-6 + 1 = -5$. Then $-2 \times -5 = 10$.

3. Fractions, Decimals and Real Numbers Review

Fractions and decimals are different ways to represent parts of a whole. Real numbers include both rational and irrational numbers.

Topic	Example	Reminder
Simplifying fractions	$12/18 = 2/3$	Divide numerator and denominator by the same number.
Mixed numbers	$2 \frac{3}{5} = 13/5$	Multiply the whole number by the denominator, then add the numerator.
Decimals to fractions	$0.75 = 75/100 = 3/4$	Use place value, then simplify.
Fractions to decimals	$3/8 = 0.375$	Divide numerator by denominator or convert to thousandths.

Number classification

Number type	Meaning	Examples
Integers	Whole numbers, zero and negative whole numbers.	$-3, -1, 0, 4$
Rational numbers	Can be written as a fraction of two integers, denominator not zero.	$-5, 1/2, 0.25, 2.75$
Irrational numbers	Cannot be written exactly as a fraction of two integers.	$\sqrt{2}, \pi$
Real numbers	All rational and irrational numbers on the number line.	Integers, fractions, decimals, $\sqrt{2}, \pi$

4. Common Mistakes to Avoid

Mistake 1: Thinking -8 is greater than -3

Correction: -8 is smaller because it is further left on the number line.

Mistake 2: Thinking minus always moves towards 0

Correction: Start at -7 . $-7 - 5$ means go down 5 steps to -12 .

Mistake 3: Forgetting sign rules

Correction: Same signs give positive; different signs give negative for multiplication and division.

Mistake 4: Ignoring brackets

Correction: Always simplify inside brackets first.

Mistake 5: Calling every decimal irrational

Correction: Terminating decimals such as 0.25 and 1.5 are rational because they can be written as fractions.

Mistake 6: Thinking all rational numbers are integers

Correction: Integers are rational numbers, but rational numbers also include fractions and decimals.

5. Review Exercise

Attempt all questions before checking the answers. Show working where needed.

1. Arrange in ascending order: $-5, 2, -1, 0, -8$.
2. Which is greater: -4 or -9 ? Explain using a number line.
3. Evaluate: $-7 + 12$.
4. Evaluate: $-3 - 8$.
5. Evaluate: -6×5 .
6. Evaluate: -8×-4 .
7. Evaluate: $42 \div -7$.
8. Evaluate: $-54 \div -9$.
9. Evaluate: $-3 + 5 \times (-2)$.
10. Evaluate: $24 \div (-6) - 3$.
11. Evaluate: $-2 \times (-4 + 7)$.
12. Simplify: $15/25$.
13. Convert $3 \frac{2}{5}$ to an improper fraction.
14. Convert 0.6 to a fraction in simplest form.
15. Convert 0.125 to a fraction in simplest form.
16. Convert $7/8$ to a decimal.
17. Convert $13/4$ to a mixed number.
18. Which of these are integers: $-6, 0.75, 4, 2/3, 0$?
19. Which of these are rational numbers: $-3, 1/5, 0.4, \sqrt{3}, \pi$?
20. Explain why 0.25 is a rational number.

6. Challenge Questions

These questions combine several Chapter 2 skills.

1. A lift starts at B4. It goes up 9 floors, then down 6 floors. What level does it stop at? Write an integer calculation.
2. Evaluate: $5 - 3 \times (-4) + 18 \div (-6)$.
3. Arrange in ascending order: -1.5 , 0.25 , -2 , $1/2$, 0 .
4. A temperature is -3°C at night. It rises by 8°C in the morning and then drops by 5°C . What is the final temperature?
5. Classify each number as integer, rational, irrational or real: -12 , 0.75 , $\sqrt{7}$, π , $5/2$.
6. Explain why every integer is a rational number, but not every rational number is an integer.

Teacher prompt: Ask students to explain their method, not only give final answers.

7. Answers and Selected Explanations

Review Exercise Answers

1. $-8, -5, -1, 0, 2$	2. -4 is greater because it is to the right of -9 on the number line.
3. 5	4. -11
5. -30	6. 32
7. -6	8. 6
9. -13	10. -7
11. -6	12. $3/5$
13. $17/5$	14. $3/5$
15. $1/8$	16. 0.875
17. $3\frac{1}{4}$	18. $-6, 4, 0$
19. $-3, 1/5, 0.4$	20. $0.25 = 1/4$, so it can be written as a fraction of two integers.

Challenge Answers

- $B4 = -4$. $-4 + 9 - 6 = -1$. It stops at B1.
- $5 - 3 \times (-4) + 18 \div (-6) = 5 + 12 - 3 = 14$.
- $-2, -1.5, 0, 0.25, 1/2$
- $-3 + 8 - 5 = 0^\circ\text{C}$.
- -12 : integer, rational, real. 0.75 : rational, real. $\sqrt{7}$: irrational, real. π : irrational, real. $5/2$: rational, real.
- Every integer n can be written as $n/1$. But rational numbers can also be fractions or decimals, such as $1/2$ and 0.25 .

8. Teacher Revision Notes

Suggested 45-minute revision flow

Time	Activity	Purpose
5 min	Quick number line recap	Warm up comparison of negative numbers.
10 min	Integer operations drill	Check sign rules and operation order.
10 min	Fractions and decimals conversion	Strengthen fraction-decimal fluency.
10 min	Real number classification	Clarify integer, rational, irrational and real number relationships.
10 min	Review Exercise discussion	Explain common traps and require full reasoning.

Exit ticket

- One integer comparison question.
- One multiplication/division sign-rule question.
- One combined operation question.
- One fraction or decimal conversion question.
- One real-number classification question.

Next: Use this page after the two Chapter 2 practice pages, then move students to mixed test-style questions.