MATHEMATICS · GRADES 4-6

Writing decimals in expanded form

Difficulty level: Intermediate

Mathematics: Grades 4-6

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Overview of the concept

This is how you show what each digit in a decimal is worth, like breaking a price into dollars, dimes, and pennies, so place value is visible and mistakes are easy to catch. Expanded form writes the decimal as its parts added together, so each digit shows its own value. That makes it easy to see whether a digit is worth dollars, dimes, or pennies, and to spot a place value mistake. It is a clear way to check a decimal, and to show you understand what each digit is worth.



Rule

Writing decimals in expanded form: write a decimal as the sum of what each digit is worth.

Each digit contributes its value in its place, ones, tenths, hundredths, and so on, added together.

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Worked examples

EXAMPLE 1

Q Write 5.67 in expanded form.

SOLUTION

This is an expanded form question, so the one rule to remember is: each digit is worth its place value, and the expanded form is the sum of those values. Work through the digits from left to right, ones first, then tenths, then hundredths.

The 5 is in the ones place, worth 5, the 6 is in the tenths place, worth 0.6, and the 7 is in the hundredths place, worth 0.07.

So 5.67 = 5 + 0.6 + 0.07

EXAMPLE 2

Q Write 42.15 in expanded form.

SOLUTION

This is the same question type with tens as well: two digits before the decimal point means a tens value and a ones value, then the decimal places as before.

The 4 is in the tens place, worth 40, the 2 is worth 2, the 1 is in the tenths place, worth 0.1, and the 5 is in the hundredths place, worth 0.05.

So 42.15 = 40 + 2 + 0.1 + 0.05

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Practice questions

1 Write 7.36 in expanded form.

- **A** 7 + 0.3 + 0.06
- **B** 7 + 0.03 + 0.006
- **C** 7 + 0.6 + 0.03
- **D** 70 + 3 + 0.06

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2 Write 63.26 in expanded form.

- **A** 60 + 3 + 0.02 + 0.006
- **B** 60 + 3 + 0.2 + 0.06
- **C** 6 + 3 + 0.2 + 0.06
- **D** 60 + 3 + 0.6 + 0.02

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3 What number is 70 + 2 + 0.3 + 0.04 in standard form?

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4 Write 3.7 in expanded form.

A. 3 + 0.07

B. 3 + 0.7

C. 30 + 7

D. 3 + 0.007

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5 Write 156.28 in expanded form using fractions.

A $100 + 50 + 6 + \frac{2}{10} + \frac{8}{100}$

B $100 + 50 + 6 + \frac{8}{10} + \frac{2}{100}$

C $100 + 50 + 6 + \frac{2}{10} + \frac{8}{10}$

D $100 + 50 + 6 + \frac{2}{100} + \frac{8}{100}$

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6 What number is $(5 \times 10) + (8 \times 1) + (2 \times 0.1) + (3 \times 0.01)$?

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7 **Write 79.015 in expanded form.**

- **A** 70 + 9 + 0.1 + 0.05
- **B** 70 + 9 + 0.01 + 0.05
- **C** 70 + 9 + 0.01 + 0.005
- **D** 7 + 9 + 0.01 + 0.005

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8 **Which expanded form matches 4.32?**

- **A** 4 + 0.2 + 0.03
- **B** 4 + 0.3 + 0.02
- **C** 40 + 3 + 0.2

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9 Write 0.583 in expanded form.

- **A** 0.5 + 0.08 + 0.003
- **B** 0.5 + 0.8 + 0.03
- **C** 0.05 + 0.08 + 0.003
- **D** 0.5 + 0.08 + 0.03

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10 Tom writes 2.17 = 2 + 0.1 + 0.7. What is wrong with his expanded form, and what is the correct form?

- **A** The 7 is worth 0.07, not 0.7; 2.17 = 2 + 0.1 + 0.07
- **B** The 1 is worth 0.01, not 0.1; 2.17 = 2 + 0.01 + 0.7
- **C** The 2 is worth 0.2, not 2; 2.17 = 0.2 + 0.1 + 0.07
- **D** Nothing is wrong; 2.17 = 2 + 0.1 + 0.7

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ANSWER KEY

1. $7 + 0.3 + 0.06$

2. $60 + 3 + 0.2 + 0.06$

3. 72.34

4. $3 + 0.7$

5. $100 + 50 + 6 + \frac{2}{10} + \frac{8}{100}$

6. 58.23

7. $70 + 9 + 0.01 + 0.005$

8. $4 + 0.3 + 0.02$

9. $0.5 + 0.08 + 0.003$

10. The 7 is worth 0.07, not 0.7; $2.17 = 2 + 0.1 + 0.07$

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