

The GED Math Foundations Roadmap

Installment 3 — Decimals & the Conversion Triangle

Lessons 8-10: Decimal Basics · Operating with Decimals · Fractions ↔ Decimals
↔ Percents

Start anywhere

Each lesson stands completely on its own — you don't need the one before it. Pick the topic you want to work on today and dive in. Every lesson tells you the idea first, shows you a worked example, gives you practice, and then explains every answer.

Every lesson speaks in the same five colors — after one lesson, you can find your place by color alone:

blue = the idea	green = worked examples	amber = your turn	violet = answers, explained	teal = more practice
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Lesson 8: Decimal Basics

Place Value Keeps Going Past the Dot

LESSON 8 OF 19	PHASE 3 · PARTS OF THE WHOLE	ABOUT 20-25 MINUTES
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Warm-Up — start with a win

Two questions you can already do. Answer them in your head — then you've officially started.

1. Which is more money: \$0.75 or \$0.57?
2. How many pennies make a dime?

Answers: \$0.75 · 10 — and that's the whole decimal system in one coin

The Concept — the idea behind the math

You already know place value on the left side of the dot: ones, tens, hundreds, each spot ten times bigger than the one to its right. A

decimal is simply that same system **continuing to the right of the dot** — except now each spot gets ten times **smaller**: tenths, hundredths, thousandths.

The dot itself just marks the border between **whole things** and **parts of a thing**.

Money is the everyday decimal. A dollar is one whole. A dime is one tenth of it (\$0.10). A penny is one hundredth (\$0.01). When you read a price tag, you're already reading decimals fluently.

The big trap to avoid: more digits does NOT mean a bigger number. 0.5 is larger than 0.45, even though 0.45 looks longer. To compare safely, **pad the shorter one with zeros** so both have the same number of places: 0.50 versus 0.45. Now it's obvious.

Worked Examples — watch the moves

Read 3.47. Three wholes, four tenths, seven hundredths — exactly like \$3.47 is 3 dollars, 4 dimes, 7 pennies.

Compare 0.5 and 0.45. Pad the first one:

0.50 vs. 0.45 → 0.5 is larger

Are 0.7 and 0.70 the same? Yes. A zero on the far right of a decimal adds no value — seven tenths equals seventy hundredths.

Check for Understanding — your turn (5 questions)

1. In the number 6.28, which digit is in the hundredths place?
2. Write “three and five tenths” as a decimal.
3. Which is larger: 0.6 or 0.06?
4. True or False: 0.50 and 0.5 are the same amount.
5. **Critical Thinking:** A scale reads 0.9 kg for one bag and 0.85 kg for another. Which bag is heavier?

PAUSE HERE — try all five on your own first. Getting them wrong costs nothing; that's what they're for.

Answer Key — every answer, explained

1. **8** (Tenths is the first spot after the dot — the 2; hundredths is the second — the 8.)
2. **3.5** (Three wholes, five tenths.)
3. **0.6** ($0.6 = \text{six tenths} = 0.60$; $0.06 = \text{six hundredths}$. Sixty hundredths beats six.)
4. **True** (The trailing zero adds no value.)
5. **The 0.9 kg bag.** (Pad it: 0.90 versus 0.85. Don't be fooled by the extra digit on 0.85.)

More Practice — reps make it stick

Answer each:

1. In 12.34, which digit is in the tenths place?
2. In 0.756, which digit is in the thousandths place?
3. Write “seven and nine hundredths” as a decimal. (Careful — you'll need a placeholder zero.)
4. Write “forty hundredths” as a decimal.

Compare each pair. Write $>$, $<$, or $=$:

5. 0.3 ? 0.30
6. 0.7 ? 0.65
7. 0.09 ? 0.1
8. 0.25 ? 0.250

More Practice — Answer Key

1. **3** (Tenths is the first spot after the dot.)
2. **6** (Thousandths is the third spot after the dot: 7 = tenths, 5 = hundredths, 6 = thousandths.)
3. **7.09** (The zero holds the tenths spot so the 9 lands in hundredths.)
4. **0.40** (Forty hundredths; equal to 0.4.)
5. **0.3 = 0.30** (Same value — the trailing zero adds nothing.)
6. **0.7 > 0.65** (Pad: 0.70 versus 0.65.)
7. **0.09 < 0.1** (Pad: 0.09 versus 0.10.)
8. **0.25 = 0.250** (Trailing zero, same amount.)

Update your tracker:

Topic	New to this	Practicing	Got this!
Reading & Writing Decimals	☐	☐	☐
Comparing Decimals	☐	☐	☐

Lesson 9: Operating with Decimals

Line Up the Dot — Except When You Multiply

LESSON 9 OF 19

PHASE 3 · PARTS OF
THE WHOLE

ABOUT 20-25 MINUTES

Warm-Up — start with a win

Two questions you can already do. Answer them in your head — then you've officially started.

1. $\$1.50 + \$1.50 = ?$
2. Ten dimes make how much money?

Answers: $\$3.00$ · $\$1.00$ — that's $10 \times 0.1 = 1$

The Concept — the idea behind the math

Adding and subtracting: stack the numbers so the **dots line up directly under each other**, fill any empty spots with zeros, then add or subtract as usual and bring the dot straight down. (Same idea as fractions: you can only combine tenths with tenths, hundredths with hundredths.)

Multiplying: ignore the dots at first. Multiply the numbers as if they were whole numbers. Then count how many decimal places were in **both** numbers combined, and put that many places in your answer.

Dividing by a whole number: divide as usual and bring the dot **straight up** into the answer, right above where it sits.

A good gut-check for any decimal answer: estimate first. $3.4 + 12.75$ should land near $3 + 13 = 16$, so an answer of 16.15 feels right and 1.615 would not.

Worked Examples — watch the moves

Add — $3.4 + 12.75$. Line up the dots and pad:

$$3.40 + 12.75 = 16.15$$

Subtract — $8 - 2.6$. Write 8 as 8.0:

$$8.0 - 2.6 = 5.4$$

Multiply — 0.3×0.4 . Ignore dots: $3 \times 4 = 12$. Both numbers had 1 decimal place, so the answer needs 2:

$$0.3 \times 0.4 = 0.12$$

Divide — $4.8 \div 2$. Divide normally, dot straight up:

$$4.8 \div 2 = 2.4$$

Check for Understanding — your turn (5 questions)

1. $2.5 + 1.35 = ?$
2. $7 - 3.2 = ?$
3. $0.2 \times 0.6 = ?$
4. $9.6 \div 3 = ?$
5. **Critical Thinking:** You buy three items: \$4.50, \$0.99, and \$3.25. What is the total?

PAUSE HERE — try all five on your own first. Getting them wrong costs nothing; that's what they're for.

Answer Key — every answer, explained

1. **3.85** (Line up: $2.50 + 1.35$.)
2. **3.8** (Write 7 as 7.0, then $7.0 - 3.2$.)
3. **0.12** ($2 \times 6 = 12$; both had one decimal place, so two places in the answer.)
4. **3.2** ($96 \div 3 = 32$; bring the dot straight up.)

- 5. \$8.74** ($4.50 + 0.99 = 5.49$; $5.49 + 3.25 = 8.74$. Estimate check: about $4 + 1 + 3 = 8$.)

More Practice — reps make it stick

Add or subtract:

- 1.** $6.3 + 2.8$
- 2.** $12.45 + 3.5$
- 3.** $10 - 4.7$
- 4.** $5.6 - 2.85$

Multiply or divide:

- 5.** 0.5×0.5
- 6.** 1.4×3
- 7.** $8.4 \div 4$
- 8.** $0.36 \div 6$

More Practice — Answer Key

- 1. 9.1** ($6.3 + 2.8$; the tenths carry: $3 + 8 = 11$.)
- 2. 15.95** (Line up: $12.45 + 3.50$.)
- 3. 5.3** (Write 10 as 10.0, then $10.0 - 4.7$.)
- 4. 2.75** (Line up: $5.60 - 2.85$.)
- 5. 0.25** ($5 \times 5 = 25$; two decimal places total.)
- 6. 4.2** ($14 \times 3 = 42$; one decimal place.)
- 7. 2.1** ($84 \div 4 = 21$; dot straight up.)
- 8. 0.06** ($36 \div 6 = 6$; dot straight up keeps it at 0.06. Check: $0.06 \times 6 = 0.36$.)

Update your tracker:

Topic	New to this	Practicing	Got this!
Adding & Subtracting Decimals	☐	☐	☐
Multiplying & Dividing Decimals	☐	☐	☐

Lesson 10: Fractions ↔ Decimals ↔ Percents

Three Names for the Same Amount

LESSON 10 OF 19

PHASE 3 · THE BRIDGE
TO PERCENTS

ABOUT 25-30 MINUTES

Warm-Up — start with a win

Two questions you can already do. Answer them in your head — then you've officially started.

1. 50% of a pizza is what fraction of it?
2. Write a quarter of a dollar as a decimal.

Answers: $1/2$ · 0.25

The Concept — the idea behind the math

A fraction, a decimal, and a percent can all describe the **exact same amount** — they're three outfits for one number. Half a pizza is $1/2$, it's 0.5, and it's 50%. Learning to change between them is one of the most useful skills on the whole test, because a problem may hand you one outfit when you'd rather work in another.

- **Fraction → Decimal:** divide the top by the bottom. (The fraction bar has always been a division sign.) $3/4 = 3 \div 4 = 0.75$.
- **Decimal → Percent:** “percent” means “per hundred,” so move the dot two places to the right and add a % sign. $0.75 \rightarrow 75\%$.
- **Percent → Decimal:** the reverse — drop the % and move the dot two places to the left. $25\% \rightarrow 0.25$.
- **Decimal → Fraction:** say it in words and write that. $0.75 =$ “seventy-five hundredths” $= 75/100$, which simplifies to $3/4$.

Worth memorizing — these turn up constantly: $1/2 = 0.5 = 50\%$ · $1/4 = 0.25 = 25\%$ · $3/4 = 0.75 = 75\%$ · $1/5 = 0.2 = 20\%$ · $1/10 = 0.1 = 10\%$.

Worked Examples — watch the moves

1/4 to a decimal, then a percent:

$$1 \div 4 = 0.25 \rightarrow 0.25 = 25\%$$

60% to a decimal, then a fraction:

$$60\% = 0.60 \rightarrow 60/100 = 3/5$$

0.8 to a percent, then a fraction:

$$0.8 = 80\% \rightarrow 8/10 = 4/5$$

Check for Understanding — your turn (5 questions)

1. Write $1/2$ as a decimal and as a percent.
2. Convert 0.25 to a percent.
3. Convert 40% to a decimal.
4. Convert $3/4$ to a decimal.
5. **Critical Thinking:** A jacket is 25% off. As a fraction, what part of the price are you saving — and as a decimal?

PAUSE HERE — try all five on your own first. Getting them wrong costs nothing; that's what they're for.

Answer Key — every answer, explained

1. **0.5 and 50%** ($1 \div 2 = 0.5$; move the dot two places right for 50%.)
2. **25%** (Move the dot two places right: $0.25 \rightarrow 25\%$.)
3. **0.40** (Drop the %, move the dot two places left; equal to 0.4.)
4. **0.75** ($3 \div 4 = 0.75$.)
5. **$1/4$ and 0.25** ($25\% = 25/100 = 1/4 = 0.25$ — all the same)

amount.)

More Practice — reps make it stick

Convert each as asked:

1. $1/5$ to a decimal
2. 0.7 to a percent
3. 50% to a fraction (simplest form)
4. $3/10$ to a decimal
5. 0.9 to a percent
6. 20% to a decimal
7. $1/4$ to a percent
8. 0.05 to a percent (*careful — tiny number*)

More Practice — Answer Key

1. **0.2** ($1 \div 5 = 0.2$.)
2. **70%** (Move the dot two places right.)
3. **$1/2$** (50/100 simplifies to $1/2$.)
4. **0.3** ($3 \div 10 = 0.3$.)
5. **90%** (Move the dot two places right.)
6. **0.2** (Drop the %, move the dot two places left: $20\% = 0.20 = 0.2$.)
7. **25%** ($1 \div 4 = 0.25 \rightarrow 25\%$.)
8. **5%** (Move the dot two places right: $0.05 \rightarrow 5\%$.)

Update your tracker:

Topic	New to this	Practicing	Got this!
Fraction ↔ Decimal	☐	☐	☐
Decimal ↔ Percent	☐	☐	☐
Percent ↔ Fraction	☐	☐	☐