

The GED Math Foundations Roadmap

Installment 6 — Building Blocks & Putting It Together

Lessons 18-19: Factors, Multiples, GCF & LCM · A Mixed Review of the Whole Roadmap

Start anywhere

The last installment. Lesson 18 stands on its own like all the others. Lesson 19 is different — it's a mixed review that pulls from every lesson in the roadmap, so you can see how much has taken root and find what's worth another pass.

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 18: Factors, Multiples, GCF & LCM

Building Blocks and Common Ground

LESSON 18 OF 19	PHASE 5 · POWERS & ROOTS	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. Does 2 go evenly into 10?
2. Count by 5s: 5, 10, __?

Answers: Yes — so 2 is a factor of 10 · 15 — you're listing multiples of 5

The Concept — the idea behind the math

Factors are the numbers that divide evenly into a number — its building blocks. The factors of 12 are 1, 2, 3, 4, 6, and 12, because

each one goes in with nothing left over.

Multiples are what you get counting by a number — its times table, marching outward. The multiples of 4 are 4, 8, 12, 16, 20, and on forever.

The easy way to keep them straight: factors live **inside** a number (they're never bigger than it, and there are only a few). Multiples go **outside** it (they're never smaller than it, and they never stop).

GCF — the Greatest Common Factor — is the biggest factor two numbers share. It's what you use to simplify a fraction to lowest terms.

LCM — the Least Common Multiple — is the smallest multiple two numbers share. It's exactly the **common denominator** you reach for when adding fractions (Lesson 6). Picture two runners on a track moving at different speeds — the LCM is the first spot they line up again.

One-word memory hook: GCF has “Factor” in it (smaller, inside); LCM has “Multiple” in it (larger, outside).

Worked Examples — watch the moves

Factors of 18: 1, 2, 3, 6, 9, 18. **First five multiples of 6:** 6, 12, 18, 24, 30.

GCF of 12 and 18. List each one's factors and find the biggest they share:

12: 1, 2, 3, 4, 6, 12 **18:** 1, 2, 3, 6, 9, 18

shared: 1, 2, 3, 6 → **GCF = 6**

LCM of 4 and 6. List multiples until they first meet:

4: 4, 8, 12, 16 ... **6:** 6, 12, 18 ... **first shared = 12 →**
LCM = 12

And that LCM is the payoff for fractions: to add $\frac{1}{4} + \frac{1}{6}$, you'd use 12 as the common denominator.

Check for Understanding — your turn (5 questions)

1. List all the factors of 16.
2. List the first five multiples of 5.
3. Find the GCF of 8 and 12.
4. Find the LCM of 3 and 4.
5. **Critical Thinking:** You're adding $\frac{1}{6} + \frac{1}{8}$. What common denominator should you use, and how do you know?

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. **1, 2, 4, 8, 16** (Each divides 16 evenly.)
2. **5, 10, 15, 20, 25** (Count by 5.)
3. **4** (Factors of 8: 1, 2, 4, 8. Factors of 12: 1, 2, 3, 4, 6, 12. Biggest shared is 4.)
4. **12** (Multiples of 3: 3, 6, 9, 12 ... Multiples of 4: 4, 8, 12 ... First shared is 12.)
5. **24** (The LCM of 6 and 8: multiples of 6 are 6, 12, 18, 24; of 8 are 8, 16, 24; they first meet at 24.)

More Practice — reps make it stick

Factors and multiples:

1. List all the factors of 20.
2. List all the factors of 9.
3. List the first five multiples of 7.

4. Is 13 a prime number? (A prime has only two factors: 1 and itself.)

Greatest Common Factor and Least Common Multiple:

5. GCF of 10 and 15

6. GCF of 16 and 24

7. LCM of 4 and 5

8. LCM of 6 and 9

More Practice — Answer Key

1. 1, 2, 4, 5, 10, 20

2. 1, 3, 9

3. 7, 14, 21, 28, 35

4. Yes (Its only factors are 1 and 13.)

5. 5 (Shared factors of 10 and 15: 1, 5. Greatest is 5.)

6. 8 (Shared factors of 16 and 24: 1, 2, 4, 8. Greatest is 8.)

7. 20 (Multiples of 4: 4, 8, 12, 16, 20; of 5: 5, 10, 15, 20.)

8. 18 (Multiples of 6: 6, 12, 18; of 9: 9, 18.)

Update your tracker:

Topic	New to this	Practicing	Got this!
Factors & Multiples	☐	☐	☐
GCF (Greatest Common Factor)	☐	☐	☐
LCM (Least Common Multiple)	☐	☐	☐

Lesson 19: Putting It Together

A Mixed Review of the Whole Roadmap

LESSON 19 OF 19

EVERY PHASE • THE
WHOLE ROADMAP

ABOUT 45-60 (split it
up!) MINUTES

Warm-Up — start with a win

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

1. What is 10% of 50?
2. $\frac{1}{2} + \frac{1}{2} = ?$

Answers: 5 • 1 — warmed up. Now the real thing.

How to Use This Review

On the real test, problems don't announce what topic they are — you have to recognize what's being asked. This review mixes everything on purpose, so you practice exactly that.

Treat it as a check-up, not a test. Work through it without flipping back to the lessons. Then check the answer key — every answer names the lesson it came from. If you miss one, that's not a failure; it's a signpost pointing at the lesson worth another pass. Miss a few in the same area, and you've found exactly where to spend your next session.

Three parts, three sittings if you like: Quick Skills, Word Problems, and — new this summer — The Gauntlet: one question from every single lesson, in order.

Part 1 — Quick Skills (14 questions)

1. In 4,275, which digit is in the hundreds place?
2. Round 3,847 to the nearest hundred.

3. Simplify $12/16$ to lowest terms.

4. $1/2 + 1/3 = ?$

5. $2/3 \times 3/4 = ?$

6. $3.5 + 2.75 = ?$

7. $0.4 \times 0.5 = ?$

8. Write $3/4$ as a percent.

9. What is 20% of 60?

10. $2 + 3 \times 4 = ?$

11. $-5 + 8 = ?$

12. $2^3 = ?$

13. $\sqrt{81} = ?$

14. The LCM of 4 and 6 = ?

PAUSE HERE — finish all fourteen before you look. Every answer below names the lesson it came from.

Part 1 — Answer Key

1. 2 (Lesson 1 — Place Value.)

2. 3,800 (Lesson 2 — Rounding.)

3. 3/4 (Lesson 5 — Simplifying; divide top and bottom by 4.)

4. 5/6 (Lesson 6 — Adding Fractions; $3/6 + 2/6$.)

5. 1/2 (Lesson 7 — Multiplying Fractions; $6/12$ simplifies.)

6. 6.25 (Lesson 9 — Adding Decimals; line up the dot.)

7. 0.2 (Lesson 9 — Multiplying Decimals; $4 \times 5 = 20$, two places $\rightarrow$ 0.20.)

8. 75% (Lesson 10 — Conversions; $3 \div 4 = 0.75 \rightarrow 75\%$.)

9. **12** (Lesson 11 — Percentages; 0.20×60 .)
10. **14** (Lesson 14 — PEMDAS; multiply first: $3 \times 4 = 12$, then $+ 2$.)
11. **3** (Lesson 15 — Signed Numbers; different signs, $8 - 5$, positive wins.)
12. **8** (Lesson 16 — Exponents; $2 \times 2 \times 2$.)
13. **9** (Lesson 17 — Square Roots; $9 \times 9 = 81$.)
14. **12** (Lesson 18 — LCM; 4, 8, 12 and 6, 12 first meet at 12.)

Part 2 — Word Problems (5 questions)

1. A \$80 pair of shoes is 25% off. What is the sale price?
2. If 4 pens cost \$6, how much do 10 pens cost?
3. A recipe needs $\frac{3}{4}$ cup of sugar. You want to make half the recipe. How much sugar do you need?
4. You buy 3 items at \$2.50 each and pay with a \$10 bill. How much change do you get?
5. A paint mix is 2 parts blue to 3 parts white. To make 15 parts of paint in all, how many parts are blue?

PAUSE HERE — set these up on paper before you peek. The setup is the skill.

Part 2 — Answer Key

1. **\$60** (Lesson 11 + basic subtraction. Discount: $0.25 \times 80 = \$20$, then $80 - 20 = 60$. Or pay 75%: $0.75 \times 80 = 60$.)
2. **\$15** (Lesson 13 — Proportions. $\frac{4}{6} = \frac{10}{x} \rightarrow 4x = 60 \rightarrow x = 15$.)
3. **$\frac{3}{8}$ cup** (Lesson 7 — “half of” means $\times \frac{1}{2}$: $\frac{1}{2} \times \frac{3}{4} = \frac{3}{8}$.)
4. **\$2.50** (Lesson 9 — Decimals. $3 \times 2.50 = 7.50$, then $10.00 - 7.50$)

= 2.50.)

- 5. 6 parts** (Lessons 12 + 13 — Ratios & Proportions. Blue is 2 of every 5 parts: $\frac{2}{5} = \frac{x}{15} \rightarrow 5x = 30 \rightarrow x = 6$.)

Part 3 — The Gauntlet: one question from every lesson, in order (18 questions)

Question 1 comes from Lesson 1, question 2 from Lesson 2, and so on through Lesson 18. By the time you finish, you've touched the entire roadmap in one sitting. If a question stops you cold, its number tells you exactly which lesson to revisit — no detective work required.

- 1.** In 9,462, which digit is in the tens place?
- 2.** Round 7.86 to the nearest tenth.
- 3.** A dressing is 2 parts vinegar and 3 parts water. What fraction of the mixture is vinegar?
- 4.** Complete the equivalence: $\frac{3}{4} = \frac{?}{20}$
- 5.** Which is larger: $\frac{5}{8}$ or $\frac{1}{2}$?
- 6.** $\frac{5}{6} - \frac{1}{2} = ?$
- 7.** $\frac{1}{2} \div \frac{1}{8} = ?$
- 8.** Which is larger: 0.505 or 0.55?
- 9.** $6 - 2.35 = ?$
- 10.** Write 0.6 as a fraction in lowest terms.
- 11.** What is 30% of 90?
- 12.** Simplify the ratio 18:12.
- 13.** 3 shirts cost \$27. How much do 7 shirts cost?
- 14.** $18 \div 3 \times 2 = ?$
- 15.** $-4 - 6 = ?$
- 16.** $10^0 + 10^1 = ?$

17. $\sqrt{49} + \sqrt{9} = ?$

18. Find the GCF of 12 and 20.

PAUSE HERE — the question number IS the lesson number. Run the whole gauntlet before checking.

Part 3 — Answer Key

1. **6** (Lesson 1 — the tens place is second from the right: 9,4**6**2.)
2. **7.9** (Lesson 2 — target is the 8; neighbor 6 pushes it up.)
3. **2/5** (Lesson 3 — 2 parts vinegar out of 5 total parts. Part-to-whole.)
4. **15** (Lesson 4 — multiply by 5/5: $3 \times 5 = 15$, $4 \times 5 = 20$.)
5. **5/8** (Lesson 5 — $1/2 = 4/8$, and $5/8$ beats $4/8$.)
6. **1/3** (Lesson 6 — common bottom 6: $5/6 - 3/6 = 2/6 = 1/3$.)
7. **4** (Lesson 7 — Keep-Change-Flip: $1/2 \times 8/1 = 8/2 = 4$. Four eighths fit in a half.)
8. **0.55** (Lesson 8 — pad it: 0.550 versus 0.505.)
9. **3.65** (Lesson 9 — write 6 as 6.00, line up the dots.)
10. **3/5** (Lesson 10 — $0.6 = 6/10$; divide top and bottom by 2.)
11. **27** (Lesson 11 — 0.30×90 .)
12. **3:2** (Lesson 12 — divide both by 6.)
13. **\$63** (Lesson 13 — $3/27 = 7/x \rightarrow 3x = 189 \rightarrow x = 63$. Or: one shirt is \$9, so 7×9 .)
14. **12** (Lesson 14 — left to right: $18 \div 3 = 6$, then 6×2 .)
15. **-10** (Lesson 15 — $-4 - 6 = -4 + (-6)$; same signs, add, keep the minus.)
16. **11** (Lesson 16 — zero exponent: $10^0 = 1$; first power: $10^1 = 10$;

$$1 + 10 = 11.)$$

17. 10 (Lesson 17 — $\sqrt{49} = 7$ and $\sqrt{9} = 3$; $7 + 3 = 10$.)

18. 4 (Lesson 18 — factors of 12: 1, 2, 3, 4, 6, 12; of 20: 1, 2, 4, 5, 10, 20. Biggest shared is 4.)

Reading Your Results — and Where to Go Next

Missed a problem? The answer key named its lesson — that's your map back. A single miss might just be a slip; **several misses in one area** is a clear signal to give that installment another session.

Use this table to find any topic fast:

Topic area	Lessons	Installment
Place value, rounding, estimation	Lessons 1-2	Installment 1
Zero & One (the VIPs)	Interlude (after Lesson 4)	Installment 1
Fractions: big picture & equivalence	Lessons 3-4	Installment 1
Comparing & operating with fractions	Lessons 5-7	Installment 2
Decimals & the conversion triangle	Lessons 8-10	Installment 3
Percentages, ratios, proportions	Lessons 11-13	Installment 4
Order of operations & signed numbers	Lessons 14-15	Installment 5
Exponents & square roots	Lessons 16-17	Installment 5
Factors, multiples, GCF & LCM	Lesson 18	Installment 6

You've worked the whole foundation now — from place value all the way to proportions, powers, and roots. Whatever you choose to revisit, you're building on real ground. Have a good rest of your summer, and I'll see you when classes start again.

Update your tracker:

Topic	New to this	Practicing	Got this!
Lesson 19 — Mixed Review (all three parts)	☐	☐	☐