

# 10 Kentucky KSA Grade 7 Math Practice Tests

*The Ultimate Test Prep Collection with Answer Explanations*

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# 10 Practice Tests

10 tests × full coverage

 Grade 7 Math — Engineered for Mastery 

Welcome to **The Architect's Workshop**.

Ten practice tests. Ten floors of a tower you're about to build. Each test lays another level of understanding — from foundation to capstone.

 **Foundation (Tests 1–3):** Learn the blueprints

 **Framework (Tests 4–6):** Build structural strength

 **Finishing (Tests 7–9):** Refine under pressure

 **Capstone (Test 10):** The final inspection

*Precision. Practice. Perfection.*

“ Every great structure  
is built one floor at a time.  
Ten levels of practice makes  
your math rock-solid. ”



# The Architectural Plan

*A 4-phase construction plan for complete mastery*

## Phase I: Foundation (Tests 1–3)

*Untimed. Explore the test format and question types. Read every answer explanation after each test.*

*Goal: understand the blueprint before you build.*



## Phase II: Framework (Tests 4–6)

*Add a timer (70 minutes). Focus on the topics that gave you trouble in Phase I. Practice showing complete work and labeling units. Goal: build structural strength.*



## Phase III: Finishing (Tests 7–9)

*Full timed conditions (60 minutes). Simulate the real exam. Review only the questions you missed — don't re-study what you already know. Goal: refine under real pressure.*



## Phase IV: Capstone (Test 10)

*Your final inspection. Full exam conditions. This is the capstone — compare with Test 1 and measure your entire growth arc. Goal: prove your mastery.*

## Blueprint Specifications

 **Multiple Choice** — select the single best answer

 **Short Answer** — show your process

 **Multi-Select** — choose ALL that apply

 **Open Response** — explain and justify

# Engineering Principles

Precision techniques for building every solution

## The D.R.A.F.T. Method

- D Define** What exactly is the question asking? Write it in your own words.
- R Retrieve** Pull out given information. List numbers, units, and relationships.
- A Assemble** Choose the right formula or strategy. Set up the equation or proportion.
- F Figure** Compute step by step. Show every operation. Label units.
- T Test** Does the answer make sense? Re-read the question. Verify the units.

## Seven Precision Rules

1. **Read twice, solve once.** The first read gives context; the second reveals what to compute.
2. **Annotate the problem.** Circle key information and underline the question.
3. **Estimate before calculating.** A quick mental approximation catches major errors.
4. **Set up the equation.** Write down the formula and plug in the numbers.
5. **Track your signs.** Rational number operations are the #1 error source in Grade 7.
6. **Eliminate unreasonable answers.** Check if the answer makes sense in the context.
7. **Never submit blanks.** On open response, even a partial setup can earn credit.

## Timing Blueprint

Tests 1–3: **Untimed** (learn the blueprints) > Tests 4–6: **70 min** (build speed) > Tests 7–10: **60 min** (exam conditions)



“Every great structure starts with a solid plan. Study the blueprints, learn from each test, and build something extraordinary.”

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# Math Reference Sheet

You may use this page during your practice tests!

| Symbol        | Name              | What It Means                                                  |
|---------------|-------------------|----------------------------------------------------------------|
| $( )$         | Parentheses       | Do this part first. $(3 + 4) \times 2 = 14$                    |
| $10^3$        | Exponent          | Multiply the base by itself that many times.<br>$10^3 = 1,000$ |
| $\frac{a}{b}$ | Fraction          | $a$ parts out of $b$ equal parts; also means $a \div b$ .      |
| $\frac{7}{3}$ | Improper Fraction | Numerator $\geq$ denominator. $\frac{7}{3} = 2\frac{1}{3}$     |
| 0.45          | Decimal           | A number with a decimal point. $0.45 = \frac{45}{100}$         |
| $> < =$       | Comparison        | Greater than, less than, equal to. $0.5 > 0.35$                |
| $(3,5)$       | Ordered Pair      | A point on the coordinate plane: $(x, y)$ .                    |

## Key Formulas

- **Volume of a rectangular prism:**

$$V = l \times w \times h$$

- **Order of operations:**

Parentheses  $\rightarrow$  Exponents  $\rightarrow$  Multiply/Divide  
 $\rightarrow$  Add/Subtract

- **Powers of 10:**

$$10^1 = 10 \quad 10^2 = 100$$

$$10^3 = 1,000 \quad 10^4 = 10,000$$

- **Fraction as division:**

$$\frac{a}{b} = a \div b$$

### Place Value Chart

|                   |           |
|-------------------|-----------|
| Millions          | 1,000,000 |
| Hundred-Thousands | 100,000   |
| Ten-Thousands     | 10,000    |
| Thousands         | 1,000     |
| Hundreds          | 100       |
| Tens              | 10        |
| Ones              | 1         |

### Decimals

|             |       |
|-------------|-------|
| Tenths      | 0.1   |
| Hundredths  | 0.01  |
| Thousandths | 0.001 |

Each place is  $10\times$  the place to its right, and  $\frac{1}{10}$  of the place to its left.

### Key Math Vocabulary

- **Sum** — the result of addition
- **Difference** — the result of subtraction
- **Product** — the result of multiplication
- **Quotient** — the result of division
- **Remainder** — what's left over after dividing
- **Factor** — a number you multiply
- **Expression** — numbers and operations without =
- **Equation** — a math sentence with =
- **Numerator** — the top number of a fraction
- **Denominator** — the bottom number of a fraction
- **Mixed number** — a whole number + a fraction
- **Equivalent fractions** — fractions with equal value
- **Decimal** — a number written with a decimal point
- **Volume** — the space inside a 3D shape
- **Coordinate plane** — a grid with  $x$  and  $y$  axes
- **Ordered pair** —  $(x, y)$  location on the plane

### Word Problem Clue Words

- **Add (+)**: total, altogether, combined, sum, increase, more than
- **Subtract (−)**: difference, how many more, fewer, remain, decrease, left
- **Multiply (×)**: each, every, groups of, times, product, per, of (with fractions)
- **Divide (÷)**: share equally, split, each group, how many groups, quotient, per



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PREVIEW

PRACTICE TEST

1

## Practice Test 1

 10 Questions

### Before You Start

- ✓ *Read each question carefully before choosing your answer.*
- ✓ *Show your work on scratch paper when you need to.*
- ✓ *Skip hard questions and come back to them later.*
- ✓ *Check your answers when you're done.*
- ✓ *Take your time — there's no rush!*

★ **You've Got This!** ★

*Do your best and show what you know!*

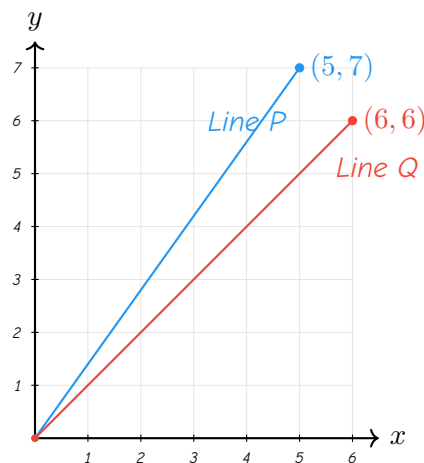


1. The table shows a proportional relationship. Find  $k$  and the missing value.

| $x$ | $y$ |
|-----|-----|
| 3   | 7.5 |
| ?   | 15  |
| 10  | 25  |

Your Answer:

2. Two proportional lines are graphed below. Which statement is correct?



- (A) Line Q has the greater unit rate because it is longer
- (B) Line P has the greater unit rate because it is steeper
- (C) Both lines have the same unit rate
- (D) Line Q has the greater unit rate because  $6 > 5$



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3. The graph below compares the rates of two workers packaging boxes. Which worker is faster, and by how many boxes per hour?



- (A) Worker A, by 3 boxes/hr  
(B) Worker B, by 3 boxes/hr  
(C) Worker A, by 15 boxes/hr  
(D) They work at the same rate
4. A store has 300 items in stock. If 60% are on sale, how many items are on sale?

- (A) 120  
(B) 150  
(C) 180  
(D) 200



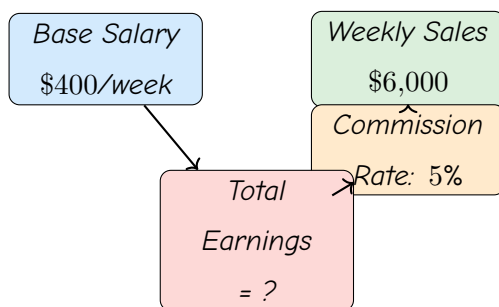
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5. The diagram shows how a salesperson's earnings are calculated. What are the total earnings?

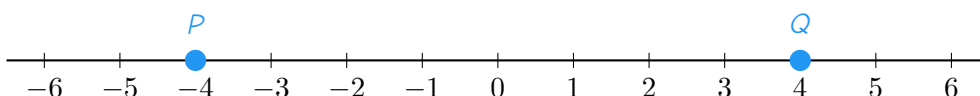


- (A) \$430                      (B) \$700  
(C) \$6,400                  (D) \$6,700

6. A jogger estimated running 5 miles but actually ran 4.8 miles. What is the percent error (rounded to the nearest tenth)?

Your Answer:

7. The number line below shows two points. Which statement is correct?



- (A) P and Q are the same number                      (B) P and Q are opposites  
(C)  $|P| > |Q|$                                               (D)  $P > Q$

8. What is  $0 + (-7)$ ?

- (A) 7                                      (B) 0  
(C) -7                                    (D) -14



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9. Evaluate  $\frac{x^2-1}{4}$  when  $x = 5$ .

Your Answer:

10. Simplify  $\frac{1}{2}x + \frac{3}{4}x - 2$ .



Your Answer:



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## ★ *End of Practice Test 1* ★

*Great job finishing the test!*

### *My Score*

*I got \_\_\_\_\_ out of 10 questions right.*

*Check your answers in the **Answer Key** at the back of the book.*

 *Review any questions you missed. That's how we learn!*

# *Answer Key & Explanations*



## Answer Key

First try each test on your own, then check your work here.



### Practice Test 1 — Answer Key

1  $k = 2.5$ ; missing  $x = 6$

2 B

3 A

4 C

5 B

6  $\approx 4.2\%$

7 B

8 C

9 6

10  $\frac{5}{4}x - 2$  or  $1\frac{1}{4}x - 2$

### 💡 Time to Learn! 💡

Review the explanations below, **especially for the questions you missed**.

Understanding why each answer is correct builds stronger problem-solving skills.

**Tip:** Circle any questions you got wrong, then read their explanation carefully.



### Practice Test 1 — Detailed Explanations

1  $k = \frac{7.5}{3} = 2.5$ . For the missing row:  $15 = 2.5x$  so  $x = 15 \div 2.5 = 6$ .

2 Line P:  $k = \frac{7}{5} = 1.4$ . Line Q:  $k = \frac{6}{6} = 1$ . Line P is steeper and has the greater unit rate.



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3 Worker A:  $60 \div 5 = 12$  boxes/hr. Worker B:  $45 \div 5 = 9$  boxes/hr. Worker A is faster by  $12 - 9 = 3$  boxes/hr.

4  $60\% = 0.60$ . Multiply:  $0.60 \times 300 = 180$  items.

5 Commission:  $6,000 \times 0.05 = \$300$ . Total:  $400 + 300 = \$700$ .

6  $\frac{|5-4.8|}{4.8} \times 100 = \frac{0.2}{4.8} \times 100 \approx 4.17 \approx 4.2\%$ .

7 Point P is at  $-4$  and Q is at  $4$ . They are the same distance from 0 on opposite sides, so they are opposites.

8 Adding 0 to any number gives that number:  $0 + (-7) = -7$ .

9 Substitute:  $\frac{5^2-1}{4} = \frac{25-1}{4} = \frac{24}{4} = 6$ .

10 Find a common denominator:  $\frac{2}{4}x + \frac{3}{4}x = \frac{5}{4}x$ . The constant stays:  $\frac{5}{4}x - 2$ .



**Well done checking your answers!**

*Keep practicing to strengthen your skills.*



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