

8

Kansas

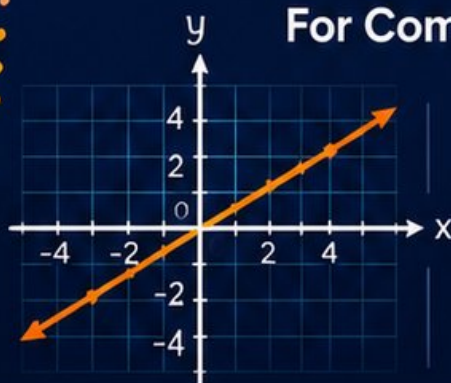
KAP

GRADE 8

MATH

PRACTICE TESTS

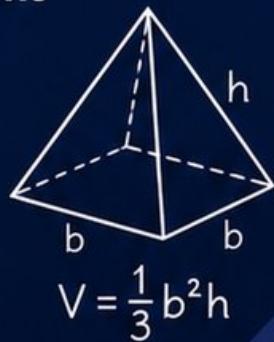
Standards Aligned Problem Solving
For Comprehensive Assessment Programs



$$A = \pi r^2$$

$$C = 2\pi r$$

$$V = \frac{1}{3}\pi r^2 h$$



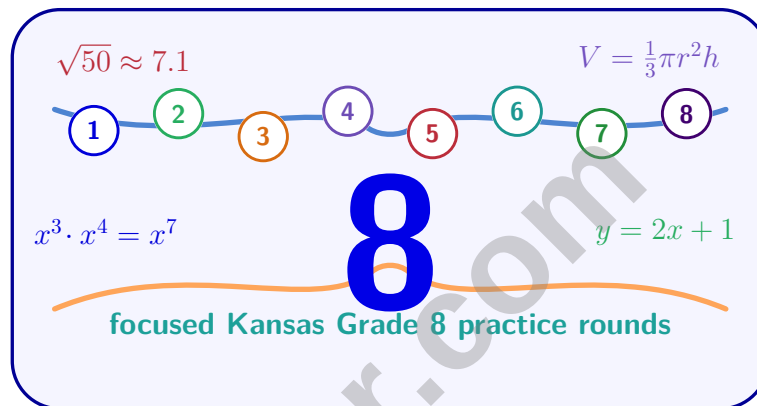
$$V = \frac{1}{3}b^2 h$$

**8** PRINTED TESTS**2** ONLINE TESTS

Use these **two additional** online practice tests for extra review after the printed tests in this book.

8 Kansas KAP Grade 8 Math Practice Tests

Kansas Grade 8 Practice for Functions, Geometry, and Data Reasoning



Eight complete 40-question Grade 8 KAP practice rounds with real numbers, exponents, scientific notation, equations, functions, transformations, geometry, data analysis, probability, answer keys, and clear explanations for every item.

Jay Daie and Reza Nazari



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Welcome, Kansas Grade 8 Problem Solver!

Eight focused rounds for sharper KAP math thinking

This book gives you eight full Grade 8 KAP math practice tests. Each round is built to help you recognize structure, reason with real numbers and exponents, analyze linear relationships, connect equations with graphs, and explain your thinking with care.

Your Kansas Practice Promise

I will read every question carefully, choose a strategy that fits, write enough work to prove my answer, and use corrections as training for the next test.

Read

Model

Verify

How to Use This Book

An eight-session plan for confident Grade 8 review

1. **Warm up with the review pages.** Notice the big ideas before starting the tests.
2. **Complete one test at a time.** Treat each 40-question round like a real practice session.
3. **Show your reasoning.** Jot an exponent rule, equation, graph, transformation, diagram, or quick estimate when it helps.
4. **Correct actively.** Rework missed items before reading the explanation.
5. **Choose the next target.** After each test, name one skill and one habit to improve.

Kansas review rhythm: Work a test, score it, study your misses, then come back ready for the next round with one clear goal.



What Is Inside?

Eight KAP tests, 320 questions, and a complete review path

Part	What You Will Practice
Tests 1–3	Real and irrational numbers, integer exponents, scientific notation, equations, and careful reading.
Tests 4–6	Slope, systems of equations, functions, inequalities, transformations, congruence, and similarity.
Tests 7–8	Pythagorean reasoning, volume, data analysis, linear models, probability, mixed review, and stamina.
Answer Pages	Compact keys and explanations that show why each answer works.

The tests are mixed on purpose. Grade 8 success means recognizing which idea is being tested even when the next question changes format.



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Table of Contents

★ Practice Test 1	_____	15
★ Practice Test 2	_____	30
★ Practice Test 3	_____	47
★ Practice Test 4	_____	63
★ Practice Test 5	_____	79
★ Practice Test 6	_____	95
★ Practice Test 7	_____	111
★ Practice Test 8	_____	128
Practice Test Answer Keys	_____	146
Practice Test Answers and Explanations	_____	151

1) A right triangle has legs of $\sqrt{32}$ and $\sqrt{4}$. What is the hypotenuse in simplified radical form?

☐ A. $\sqrt{36}$ (which is 6)

☐ C. $\sqrt{28}$

☐ B. 6

☐ D. $\sqrt{68}$

2) A two-way table of 480 products tracks quality and price point:

	Premium	Standard	Total
High Quality	240	80	320
Low Quality	48	112	160
Total	288	192	480

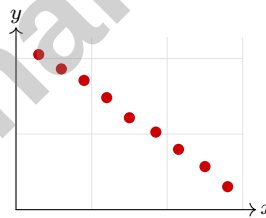
What joint relative frequency represents high-quality premium products?

☐ A. $\frac{240}{320} = 0.75$

☐ C. $\frac{240}{480} = 0.50$

☐ B. $\frac{240}{288} \approx 0.83$

☐ D. $\frac{240}{320} \approx 0.67$



3)

A scatter plot of monthly temperature (x) versus monthly heating costs (y) shows a strong negative relationship. Which statement correctly interprets this?

☐ A. Heating costs and temperature are unrelated

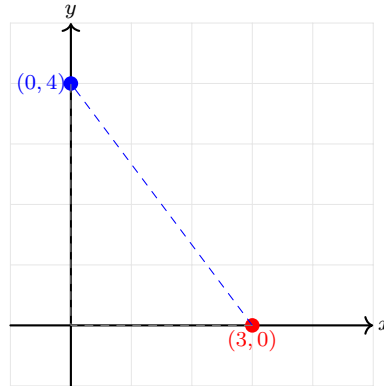
☐ C. Higher temperatures cause lower heating bills

☐ B. Lower heating bills cause warmer weather

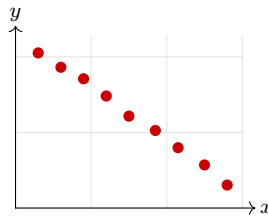
☐ D. As temperature increases, heating costs tend to decrease


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- 4) A student is finding the distance between points $(3, 0)$ and $(0, 4)$ and writes: $d = 3 + 4 = 7$. What is the error?



- ☐ A. They should square the differences before adding them.
 ☐ C. They forgot to take the square root.
- ☐ B. The answer is actually correct.
 ☐ D. They added instead of subtracting the coordinates.
- 5) A square prism and a square pyramid have the same base side length (5 cm) and height (15 cm). How many times larger is the prism's volume than the pyramid's?
- ☐ A. 1.5 times
 ☐ C. 3 times
- ☐ B. 2 times
 ☐ D. 5 times



6)

A scatter plot displays the number of hours spent watching television versus hours spent exercising per week for 25 teenagers. The points show a downward trend: as TV hours increase, exercise hours decrease. What type of correlation is shown?

- ☐ A. Positive correlation
 ☐ C. No correlation
- ☐ B. Negative correlation
 ☐ D. Equal correlation on both sides



- 7) A data set has values $\{1, 2, 3\}$ and mean $= 2$. After adding one more data point, the new mean is still 2. What is the new MAD?
- ☐ A. $\frac{1}{2}$ ☐ C. $\frac{3}{4}$
☐ B. $\frac{2}{3}$ ☐ D. 1
- 8) A menu has 4 drink types and 5 snack types. A customer orders one drink and one snack. How many different orders are possible?
- ☐ A. $4 + 5 = 9$ ☐ C. $5^4 = 625$
☐ B. $4 \times 5 = 20$ ☐ D. $4^5 = 1,024$
- 9) What is $0.\overline{6}$ as a fraction?
- ☐ A. $\frac{1}{6}$ ☐ C. $\frac{6}{99}$
☐ B. $\frac{6}{10}$ ☐ D. $\frac{2}{3}$
- 10) A scientist measures a cell with diameter 5.3×10^{-6} mm. Convert this to standard form.
- ☐ A. 5,300 mm ☐ C. 5.3 mm
☐ B. 0.0053 mm ☐ D. 0.0000053 mm
- 11) Which of the following is rational?
- ☐ A. π ☐ C. 0.101001000... (non-repeating)
☐ B. $\sqrt{15}$ ☐ D. $\sqrt{36}$
- 12) Between which two consecutive integers does $\sqrt[3]{20}$ lie?
- ☐ A. 4 and 5 ☐ C. 3 and 4
☐ B. 1 and 2 ☐ D. 2 and 3



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- 1) A car depreciates \$2000 per year. It is worth \$18,000 now. Which equation gives its value V after t years?

☐ A. $V = 2000t + 18000$

☐ C. $V = 18000t - 2000$

☐ B. $V = -2000t + 18000$

☐ D. $V = 18000 - t$

- 2) Company A: $A(d) = 40 + 0.15d$. Company B through $(100, 55)$ and $(200, 80)$. Which has higher rate?

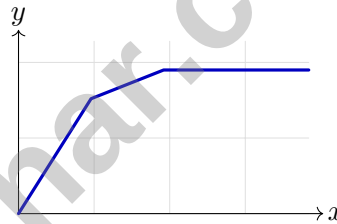
☐ A. Company A

☐ C. Both same.

☐ B. Company B

☐ D. Cannot be determined.

- 3) A student studies for an exam and creates a graph: time studied vs. score. The first 2 hours give a big score boost, the next 2 hours give less improvement, and after that, no more gains. What is the graph shape?



- ☐ A. Steep rise, then gentle rise, then flat
- ☐ B. Gradual rise throughout
- ☐ C. Steep rise throughout
- ☐ D. Flat throughout (no improvement)
- 4) In a triangle, two angles measure 45° and 75° . What is the measure of the third angle?

☐ A. 30°

☐ C. 90°

☐ B. 60°

☐ D. 120°



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- 5) Among 300 shoppers surveyed, 180 shop online and 120 shop in-store. Of those who shop online, 108 use mobile apps. What percentage of online shoppers use mobile apps?

☐ A. 36%☐ C. 60%☐ B. 48%☐ D. 72%

- 6) When sketching a line of best fit by eye, the line should:

☐ A. Pass through every single point☐ D. Have approximately equal numbers of points above and below it☐ B. Have the steepest possible slope☐ C. Avoid all outliers completely

- 7) Two hikers start from the same point, walking in opposite directions. One walks at 4 mph, the other at 5 mph. After how many hours are they 27 miles apart?



- 8) A cube with edge 2 m is attached to a rectangular prism with dimensions $4 \times 2 \times 2$ m (where the cube shares a 2×2 face). If we ignore the shared face, what is the total surface area of the composite solid?

☐ A. 40 m^2 ☐ C. 64 m^2 ☐ B. 56 m^2 ☐ D. 72 m^2 

1) A combination lock has 3 dials, each with digits 0–9. How many different combinations are possible?

☐ A. $10 + 10 + 10 = 30$

☐ C. 10^{10}

☐ B. $10 \times 10 \times 10 = 1,000$

☐ D. $3^{10} = 59,049$

2) Which ordered pair is NOT in the solution region of $x + y \leq 4$?

☐ A. (1, 2)

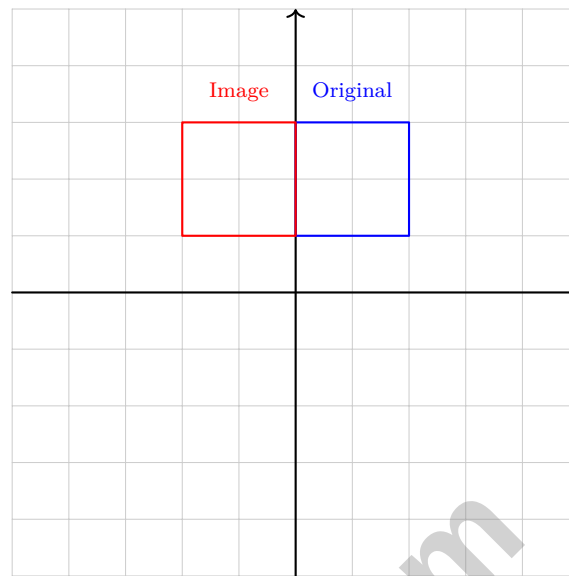
☐ C. (0, 4)

☐ B. (2, 2)

☐ D. (3, 2)

3) A principal of \$3,000 is invested at 5% compound interest annually. What is the amount after 2 years (rounded to nearest cent)?





4)

What single transformation maps the blue figure to the red figure?

- ☐ A. Reflection across the line $x = 0$ (the y -axis)
- ☐ B. Translation 3 units left
- ☐ C. Rotation 180° about $(1, 2)$
- ☐ D. Dilation with center $(0, 2)$ and scale factor 2

5) A line passes through $(-2, 1)$ and $(2, 9)$. What is the slope?

- ☐ A. $\frac{1}{2}$
- ☐ B. 8
- ☐ C. 4
- ☐ D. 2

6) Solve for y : $\frac{y}{2} + \frac{y}{3} = 10$

- ☐ A. $y = 10$
- ☐ B. $y = 20$
- ☐ C. $y = 15$
- ☐ D. $y = 12$



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Kansas KAP Grade 8 Practice Test Answer Keys**How to use this section with a Grade 8 student:**

1. check the answer first and circle any item that needs another look
2. retry the problem with fresh work before reading the explanation
3. write one short lesson learned from each missed or guessed item

A strong review routine turns every correction into a sharper plan for the next Kansas KAP practice test.

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Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

- 1) **Choice B is correct.** **(8.G.7, 8.G.8)** From $(\sqrt{32})^2 + (\sqrt{4})^2 = c^2$, we get $32 + 4 = 36$, so $c = \sqrt{36} = 6$.
- 2) **Choice C is correct.** **(8.SP.3)** Joint relative frequency divides the cell count (240) by the grand total $(480) = 0.50$. Options A and B are conditional frequencies; D is a marginal.
- 3) **Choice D is correct.** **(8.SP.2)** A negative trend shows that warmer months have lower heating costs, a natural relationship that does not imply causation.
- 4) **Choice A is correct.** **(8.G.9)** Correct method: $d = \sqrt{(3-0)^2 + (0-4)^2} = \sqrt{9+16} = \sqrt{25} = 5$ units. The student used addition instead of the Pythagorean Theorem.
- 5) **Choice C is correct.** **(8.G.11a)** Prism: $V_p = B \times h = 25 \times 15 = 375 \text{ cm}^3$. Pyramid: $V_{py} = \frac{1}{3} \times 25 \times 15 = 125 \text{ cm}^3$. Ratio: $\frac{375}{125} = 3$.
- 6) **Choice B is correct.** **(8.SP.1)** A downward trend (one variable increases while the other decreases) indicates negative correlation. In this case, more TV time is associated with less exercise time.
- 7) **Choice A is correct.** **(8.G.9)** Original data: $\{1, 2, 3\}$, mean = 2. New point must equal 2 to keep mean at 2. New data: $\{1, 2, 2, 3\}$, deviations $\{1, 0, 0, 1\}$. MAD = $2/4 = 0.5$.
- 8) **Choice B is correct.** **(8.G.4)** Choose from 4 drinks and 5 snacks: $4 \times 5 = 20$ possible orders.
- 9) **Choice D is correct.** **(8.G.11)** Let $x = 0.\bar{6}$. Then $10x = 6.\bar{6}$. Subtracting: $9x = 6$, so $x = \frac{6}{9} = \frac{2}{3}$.
- 10) **Choice D is correct.** **(8.EE.2)** Move the decimal 6 places left: $5.3 \times 10^{-6} = 0.0000053 \text{ mm}$.
- 11) **Choice D is correct.** **(8.NS.1)** $\sqrt{36} = 6$, which is an integer and therefore rational. The others are irrational: π is transcendental, $\sqrt{15}$ is a square root of a non-perfect square, and $0.101001000\dots$ is non-terminating and non-repeating.
- 12) **Choice D is correct.** **(8.NS.2)** $2^3 = 8$ and $3^3 = 27$. Since $8 < 20 < 27$, we have $2 < \sqrt[3]{20} < 3$.
- 13) **Choice D is correct.** **(8.NS.2)** $\frac{\sqrt{30}}{\sqrt{3}} = \sqrt{10} \approx 3.16$.
- 14) **Choice D is correct.** **(8.G.8)** Account A: $I = 1000 \times 0.04 \times 5 = \200 . Account B: $A = 1000(1.03)^5 \approx 1159.27$, so interest $\approx \$159.27$. Account A earns more interest.
- 15) **The correct answer is 6.** **(8.G.11)** Area scales by k^2 : $96 \times \left(\frac{1}{4}\right)^2 = 96 \times \frac{1}{16} = 6$.
- 16) **Choice D is correct.** **(8.EE.2)** $(k^2)^3 = k^6$; then $k^6 \cdot k^{-1} = k^5$; then $\frac{k^5}{k^5} = k^0 = 1$.
- 17) **Choice D is correct.** **(8.EE.3)** Rewrite with common exponent: $7.8 \times 10^7 - 0.23 \times 10^7 = (7.8 - 0.23) \times 10^7 = 7.57 \times 10^7$.
- 18) **The correct answer is A,B.** **(8.F.5)** From $(0, 1)$ to $(2, 5)$, the function increases, so A is true. From $(2, 5)$ to $(4, 5)$, the function is constant, so B is true. It is not decreasing on $[2, 4]$, the maximum is 5, and the y -intercept is 1.
- 19) **Choice D is correct.** **(8.G.9)** Parallel lines have the same slope. Since the first line has slope 4, the parallel line must also have slope 4.
- 20) **Choice C is correct.** **(8.EE.7)** Both sides are identical $(2x + 3 = 2x + 3)$, so the equation is true for all values of x . This is an identity, not "no solution."
- 21) **Choice A is correct.** **(8.F.2)** When two distinct lines do not intersect (parallel lines), they have no points in common, so the system has no solution.
- 22) **Choice D is correct.** **(8.EE.1)** $8^2 = 64$ and $9^2 = 81$. Since $64 < 77 < 81$, we have $8 < \sqrt{77} < 9$.
- 23) **Choice D is correct.** **(8.EE.4)** At $(4, 9)$, the ratio $y : x = 9 : 4$. This is equivalent to $2.25 : 1$. Slope $k = 9/4 = 2.25$.
- 24) **Choice C is correct.** **(8.G.1a)** Difference of squares: $(x + 4)(x - 4) = x^2 - 4^2 = x^2 - 16$.
- 25) **Choice C is correct.** **(8.F.1)** A point has one x -value with one y -value, so it passes the vertical line test. A vertical line is not a function (fails VLT). Circles and ellipses fail the VLT.
- 26) **The correct answer is 90.** **(8.G.5)** Let the angles be x , $2x$, and $3x$. Sum: $x + 2x + 3x = 180 \implies 6x = 180 \implies x = 30^\circ$. Largest angle: $3x = 90^\circ$.
- 27) **Choice B is correct.** **(8.F.3)** $y = 3x - \frac{1}{5}$ is in the form $y = mx + b$ with $m = 3$ and $b = -\frac{1}{5}$, so it is linear.
- 28) **Choice A is correct.** **(8.F.4)** Slope is $\frac{\Delta P}{\Delta t} = \frac{6}{3} = 2$ thousand per year from $t = 0$ to $t = 3$ (or any consecutive pair).



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Hi, Future Algebra Thinker!

◇ Grade 8 practice builds a bridge to high school mathematics through exponents, linear systems, functions, transformations, geometry, and data models. This wide-ranging book gave you eight serious Grade 8 practice tests, so you had repeated chances to build accuracy, pacing, and confidence. ◇

★ **Remember this:** Every time you solved for an unknown or explained a relationship, you were building skills that future math will use again. ★

Bridge Skills

- **Use Variables:** Let letters stand for unknown values.
- **Balance Equations:** Keep both sides fair.
- **Read Graphs:** Connect points to meaning.
- **Compare Rates:** Look for constant relationships.

Grade 8 test-day tip: When you see a variable, say what it represents. That keeps algebra connected to the problem.

If you want to share something or ask a question, please email me at jay@testinar.com.

Jay Daie

Your Algebra Bridge Coach

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Questions designed to cover essential Grade 8 math standards.



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Multiple-choice, short answer, and more to build well-rounded skills.



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Engaging problems that connect math to everyday life.



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Track improvement and build confidence with every test.



BUILD SKILLS & BOOST CONFIDENCE

Strengthen understanding and feel prepared for test day.



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- ✓ Linear Equations
- ✓ Functions
- ✓ Geometry
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