y = mx + b

x^2 + 5x + 6 = 0

KENTUCKY KSA

sqrt(x)

7th GRADE MATH



MADE RIDICULOUSLY SIMPLE

A Comprehensive 7th Grade Math Study Guide to Acing the KSA Test

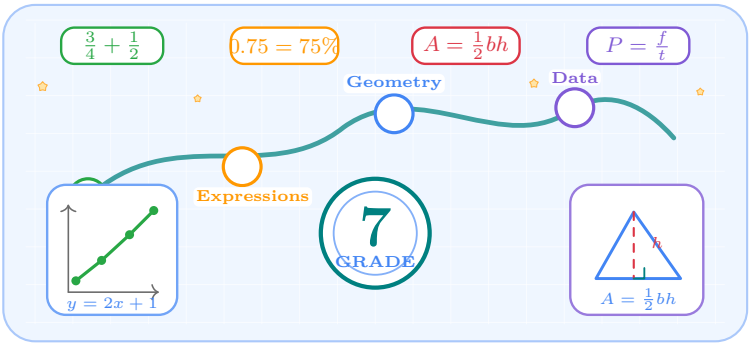
- COVERS ALL 7TH GRADE MATH STANDARDS
- EASY-TO-UNDERSTAND LESSONS & EXAMPLES
- PRACTICE QUESTIONS WITH DETAILED EXPLANATIONS
- TEST-TAKING STRATEGIES & TIPS
- BUILD CONFIDENCE. IMPROVE SCORES. SUCCEED!

LEARN SMART. PRACTICE MORE. ACE THE KSA!

Kentucky KSA

7th Grade Math Made Ridiculously Simple

A Comprehensive 7th Grade Math Study Guide to Acing the KSA Test



Reza Nazari

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KY.7.G.1	Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale
KY.7.G.2	Draw (freehand, with ruler and protractor and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle
KY.7.G.3	Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids
KY.7.G.4	Use formulas for area and circumference of circles and their relationships
KY.7.G.5	Apply properties of supplementary, complementary, vertical and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure
KY.7.G.6	Solve problems involving area of two-dimensional objects and surface area and volume of three-dimensional objects
KY.7.NS	Apply operations with rational numbers including integers, fractions, and decimals
KY.7.NS.1	Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram
KY.7.NS.2	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers
KY.7.NS.3	Solve real-world and mathematical problems involving the four operations with rational numbers
KY.7.RP	Analyze proportional relationships and use them to solve problems
KY.7.RP.1	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units
KY.7.RP.2	Recognize and represent proportional relationships between quantities
KY.7.RP.3	Use percents to solve mathematical and real-world problems
KY.7.SP	Use random sampling to draw inferences and develop probability models
KY.7.SP.0	Create displays, including circle graphs (pie charts), scaled pictographs and bar graphs, to compare and analyze distributions of categorical data from both matching and different-sized samples

KY.7.SP.1	Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences
KY.7.SP.2	Use data from a random sample to draw inferences about a population with an unknown characteristic of interest
KY.7.SP.3	Describe the degree of visual overlap (and separation) from the graphical representations of two numerical data distributions (box plots, dot plots) with similar variabilities with similar contexts (same variable), measuring the difference between the centers (medians or means) by expressing this difference as a multiple of a measure of variability (interquartile range when comparing medians or the mean absolute deviation when comparing means)
KY.7.SP.4	Calculate and use measures of center (mean and median) and measures of variability (interquartile range when comparing medians and mean absolute deviation when comparing means) for numerical data from random samples to draw informal comparative inferences about two populations
KY.7.SP.5	Describe the probability of a chance event is a number between 0 and 1, which tells how likely the event is, from impossible (0) to certain (1). A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely and a probability near 1 indicates a likely event
KY.7.SP.6	Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency and predict the approximate relative frequency given the probability
KY.7.SP.7	Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy
KY.7.SP.8	Find probabilities of compound events using organized lists, tables, tree diagrams and simulation

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✎ Practice Problems

Write $<$, $>$, or $=$ in each box to make the statement true.

1. $-5 \square -2$ _____

2. $-8 \square -11$ _____

3. $7 \square -7$ _____

4. $-4 \square 0$ _____

5. $-15 \square -15$ _____

6. $-1 \square -100$ _____

7. $-9 \square 3$ _____

8. $|-6| \square 6$ _____

9. $-|-4| \square -4$ _____

10. $|-10| \square |-12|$ _____

11. $-20 \square -19$ _____

12. $0 \square -1$ _____

13. $-(-3) \square -3$ _____

14. $-|7| \square -7$ _____

15. $-25 \square -52$ _____

Study Tips

- ☞ Among two negative integers, the one with the **smaller absolute value** is **greater**: $-3 > -10$ because $3 < 10$.
- ☞ Any positive integer is always greater than any negative integer: $1 > -1{,}000{,}000$.
- ☞ When ordering a mixed set, negatives always come before zero, and zero comes before all positives.

✍ Word Problems

16. Five students competed in a math quiz bowl where correct answers earn points and incorrect answers lose points. Their final net scores were: -16, 8, -4, -21, and 5. Order the scores from *lowest to highest* and identify the student with the best score and the student with the worst score. Then find the range of scores (highest minus lowest).

_____

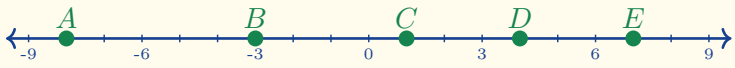
17. Four ocean animals are recorded at the following depths below the surface: a shark at -85 feet, a jellyfish at -12 feet, a sperm whale at -210 feet, and a yellowfin tuna at -47

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feet. Order the animals from *shallowest* to *deepest* depth. How much deeper is the sperm whale than the shark?

_____

18. Five points are plotted on the number line shown here. Identify the integer at each point, then list the points in order from least to greatest. Which point has the greatest absolute value?



_____

1.4 Adding Integers

KY.7.NS.1

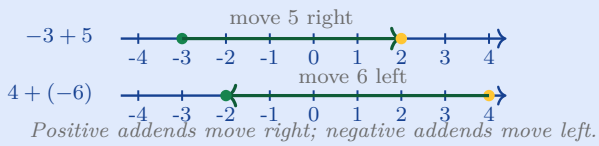
Think of adding integers as combining movements on a number line—or combining gains and losses in everyday life. Here is the key: when both numbers share the same sign, they move in the same direction, so you add the absolute values and keep that sign. When the signs are different, the numbers pull in opposite directions; you subtract the smaller absolute value from the larger one and keep the sign of whichever was stronger. You will also meet **zero pairs** (additive inverses), which show why a positive and its matching negative cancel out completely. Master these two rules and integer addition will feel natural every time.

Key Concepts & Quick Review

Same signs: Add the absolute values; keep the common sign. **Example:** $(-5)+(-8)=-(5+8)=-13$

Different signs: Subtract the smaller $|\cdot|$ from the larger; keep the sign of the larger $|\cdot|$.
Example: $(-9)+4=-(9-4)=-5$

Additive inverse: $a+(-a)=0$ **Identity:** $a+0=a$



Positive addends move right; negative addends move left.

Examples

① Evaluate $(-13) + 7$.

Think It Through: The signs are different, so subtract the smaller absolute value from the larger one. That gives $13 - 7 = 6$. Now decide the sign by looking at which number has the larger absolute value. Since 13 is larger than 7, the negative number wins. So the sum is -6.

Answer: -6

② A hiker starts at 240 feet above sea level, descends 380 feet, then climbs back up 95 feet. What is the hiker's final elevation?

Think It Through: Translate the changes into integers: $240 + (-380) + 95$. First combine 240 and -380. Because the signs are different, subtract $380 - 240 = 140$ and keep the sign of the larger absolute value, which is negative, so the result is -140. Then add 95: $-140 + 95 = -45$. The final elevation is -45 feet, which means 45 feet below sea level.

Answer: -45 *feet*

Practice Problems

Find each sum.

1. $5 + (-8) =$ _____

2. $(-6) + (-9) =$ _____

3. $(-12) + 7 =$ _____

4. $(-3) + 15 =$ _____

5. $(-14) + (-6) =$ _____

6. $8 + (-8) =$ _____

7. $(-25) + 13 =$ _____

8. $(-9) + (-11) =$ _____

9. $17 + (-24) =$ _____

10. $(-30) + 45 =$ _____

11. $(-7) + (-7) + 4 =$ _____

12. $12 + (-5) + (-9) =$ _____

13. $(-20) + (-15) + 30 =$ _____

14. $(-6) + 13 + (-4) =$ _____

15. $36 + (-49) =$ _____

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