



Praxis® Core Mathematics

Khan Academy Instructional Support Videos and Exercises

The *Praxis*[®] Program has identified videos and exercises available at <u>www.khanacademy.org</u> to support test preparation for the *Praxis* Core Academic Skills for Educators: Mathematics (5732) assessment. Each topic included in the test is mapped to a video or exercise that may help you prepare to answer questions related to that topic.

Praxis Core Academic Skills for Educators: Mathematics Topic	Khan Academy videos
I. Number and Quantity	
A. Ratios and Proportional Relationships	
 Understand ratio concepts and use ratio reasoning to solve problems 	Intro to ratios Ratio word problems Intro to rates Ratio word problem: centimeters to kilometers

 Analyze proportional relationships and use them to solve real-world and mathematical problems 	Intro to percents Percent, fraction, decimal conversions Percent problems Percent word problems Identifying proportional relationships Average rate of change Average rate of change word problems
	Writing & solving proportions Writing & solving proportions
B. The Real Number System	
 Apply understanding of multiplication and division to divide fractions by fractions 	Fractions intro Fractions on the number line Equivalent fractions Comparing fractions Common denominators Decomposing fractions Adding and subtracting fractions with like denominators Mixed numbers Adding and subtracting fractions with unlike denominators Adding and subtracting fractions with unlike denominators Adding and subtracting fractions word problems Adding and subtracting fractions word problems Multiplying whole numbers and fractions Multiplying fractions Multiplying mixed numbers Multiplying fractions Multiplying fractions word problems Fractions as division Dividing unit fractions and whole numbers Dividing fractions by fractions Dividing fractions word problems Fractions by fractions Dividing fractions word problems Fractions by fractions Dividing fractions word problems Fractions

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	<u>Place value</u>
	Rounding whole numbers
	Regrouping whole numbers
	Divisibility tests
	Factors and multiples
	<u>Prime numbers</u>
	Prime factorization
	Least common multiple
	Greatest common factor
	Intro to decimals
	Decimals on the number line
	Rounding decimals
	Comparing decimals
	Rewriting decimals as fractions
2. Compute fluently with multi-digit numbers and	Adding decimals
find common factors and multiples	Subtracting decimal
	Adding and subtracting decimals word problems
	Multiplying decimals
	Dividing decimals
	Operations with decimals
	Intro to negative numbers
	Order negative numbers
	Number opposites
	Negative numbers
	Intro to adding negative numbers
	Intro to subtracting negative numbers
	Adding & subtracting negative numbers
	Multiplying & dividing negative numbers
	Absolute value
	Decimals, fractions and percentages
	Order of operations
3. Apply understanding of operations with fractions	Arithmetic properties
to add, subtract, multiply, and divide rational	Distributive property
numbers	
	Number patterns

 Know that there are numbers that are not rational, and approximate them by rational numbers 	Rational and irrational numbers
5. Work with radicals and integer exponents	Exponents Square roots Cube roots Exponent properties Negative exponents Scientific notation Orders of magnitude Computing with scientific notation Negative exponents Exponent properties Scientific notation intro Scientific notation intro Scientific notation word problems
C. Quantities	
 Reason quantitatively and use units to solve problems 	Intro to dimensional analysis Dimensional analysis for converting Dimensional analysis for proportional reasoning Word problems with multiple units Determining precision in descriptive modeling
II. Algebra and Functions	
A. Seeing Structure in Expressions	
 Apply understanding of arithmetic to algebraic expressions 	Intro to variablesIntroduction to variablesSubstitution & evaluating expressionsSubstitution & evaluating expressionsExpression value intuitionConstructing numeric expressionsEvaluating expressions word problemsIntroduction to sequences

		Introduction to arithmetic sequences
		Constructing arithmetic sequences
		Introduction to geometric sequences
		Constructing geometric sequences
		Modeling with sequences
		Writing algebraic expressions introduction
2.	Solve real-life and mathematical problems using	Writing basic algebraic expressions word problems
	numerical and algebraic expressions	Writing algebraic expressions
		Combining like terms
		Distributive property
		Equivalent algebraic expressions
3.	Use properties of operations to generate	Nested fractions
• •	equivalent expressions	Adding & subtracting polynomials
		Multiplying binomials
		<u>Multiplying binomials</u> Special products of binomials
B. Rea	asoning with Equations and Inequalities	
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B. Rea	asoning with Equations and Inequalities	Special products of binomials Slope
	asoning with Equations and Inequalities Understand the connections between	Special products of binomials Slope Slope-intercept form intro
		Special products of binomials Special products of binomials Slope Slope-intercept form intro Writing slope-intercept equations
	Understand the connections between	Special products of binomials Slope Slope-intercept form intro Writing slope-intercept equations Interpreting linear functions and equations
	Understand the connections between proportional relationships, lines, and linear	Special products of binomials Slope Slope-intercept form intro Writing slope-intercept equations Interpreting linear functions and equations Comparing linear functions
	Understand the connections between proportional relationships, lines, and linear	Special products of binomials Slope Slope-intercept form intro Writing slope-intercept equations Interpreting linear functions and equations Comparing linear functions Constructing linear models for real-world relationships
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1.	Understand the connections between proportional relationships, lines, and linear equations Understand solving equations as a process of reasoning and explain the reasoning	Special products of binomials Slope Slope-intercept form intro Writing slope-intercept equations Interpreting linear functions and equations Comparing linear functions Constructing linear models for real-world relationships Linear models word problems Graphing proportional relationships Algebraic equations basics
1.	Understand the connections between proportional relationships, lines, and linear equations Understand solving equations as a process of	Special products of binomials Slope Slope-intercept form intro Writing slope-intercept equations Interpreting linear functions and equations Comparing linear functions Constructing linear models for real-world relationships Linear models word problems Graphing proportional relationships Algebraic equations basics One-step equations intuition

5.	Analyze and solve linear equations and pairs of simultaneous linear equations	Solutions to two-variable linear equations x-intercepts and y-intercepts Systems of equations intro Graphical representation of systems of equations Elimination method for systems of equations
		Substitution method for systems of equations Solving any system of linear equations Graphing two-variable inequalities Deint close form
	Represent and solve equations and inequalities graphically	Point-slope form Standard form
C. Fun	ctions	
1.	Interpreting functions	Introduction to functions Evaluating functions Inputs and outputs of a function Functions and equations Interpreting function notation Introduction to the domain and range of a function Determining the domain of a function

2. Building functions	Recognizing functions Intervals where a function is positive, negative, increasing, or decreasing Interpreting features of graphs
III. Geometry	
A. Congruence and Similarity	
 Draw, construct, and describe geometrical figures and describe the relationships between them 	Lines, line segments, and rays Measuring segments Parallel and perpendicular Points, lines, & planes Geometric definitions The golden ratio Properties of shapes Classifying geometric shapes Triangle types Triangle inequality theorem Quadrilateral types
2. Experiment with transformations in the plane	Coordinate planeTriangle similarity introSolving similar trianglesCoordinate plane: quadrant 1Coordinate plane: 4 quadrantsQuadrants on the coordinate planeReflecting points on coordinate planeQuadrilaterals on the coordinate planeDrawing polygons in the coordinate planeIntroduction to rigid transformationsTranslationsReflectionsDilations or scaling around a point

	Sequences of transformations
	Properties and definitions of transformations
	Symmetry
B. Right Triangles	
1. Understand and apply the Pythagorean theorem	<u>Pythagorean theorem</u> <u>The Pythagorean theorem</u>
C. Circles	
1. Understand and apply theorems about circles	Circumference and area of circles Area and circumference of circles Circle basics Arc measure Arc length (degrees) Sectors
D. Geometric Measurement and Dimension	
 Solve real-life and mathematical problems involving angle measure, area, surface area, and volume 	Angle introduction Measuring angles Constructing angles Angles in circles Angle types Vertical, complementary, and supplementary angles Angles between intersecting lines Triangle angles Angles with polygons Area of triangles Area of rectangles Count unit squares to find area

	Area of rectangles	
	Area of parallelograms	
	Area of triangles	
	<u>Perimeter</u>	
	<u>Perimeter</u>	
	Volume of a rectangular prism	
	Volume of rectangular prisms	
	Volume with fractions	
	Surface area	
	Area of shapes on grids	
2. Explain volume formulas and use them to solve	Area of trapezoids & composite figures	
problems	Volume of cones, cylinders, and spheres	
	Cross sections of 3D objects	
E. Modeling with Geometry		
1. Apply geometric concepts in modeling situations	Surface and volume density	
IV. Statistics and Probability		
A. Basic Statistics and Probability		
	Representing data	
	Stem and leaf plots	
	Picture graphs, bar graphs, and histograms	
1. Develop understanding of statistical variability	Frequency tables and dot plots	
	Statistics overview	
	Categorical data displays	
	Population variance and standard deviation	

2. Summarize and describe distributions	<u>Comparing features of distributions</u> <u>Mean and median: The basics</u> <u>More on mean and median</u>
 Use random sampling to draw inferences about a population 	Sampling and surveys Samples and surveys
 Investigate chance processes and develop, use, and evaluate probability models 	Basic theoretical probability Probability using sample spaces
5. Investigate patterns of association in bivariate data	Two-way tables for categorical data Dot plots and frequency tables Scatterplots and correlation Introduction to scatter plots Interpreting scatter plots Estimating lines of best fit Two-way tables

B. Interpreting Categorical and Quantitative Data		
 Summarize, represent, and interpret data on a single count or measurement variable 	Histograms Stem-and-leaf plots Line graphs	
2. Interpret linear models	Correlation and causality	
C. Making Inferences and Justifying Conclusions		
 Understand and evaluate random processes underlying statistical experiments 	Population variance and standard deviation	
D. Using Probability to Make Decisions		
1. Use probability to evaluate outcomes of decisions	Experimental probability Count outcomes using tree diagram	