



Computing Technology for Math Excellence

Preparing for the Ohio Graduation Test in Mathematics

Strand Resources: Patterns, Functions, and Algebra

The following pages are for students. Use them to help you monitor your own test preparation. You can print the entire booklet, or just those pages for benchmarks you want to work on. The resources provided are at CT4ME:
http://www.ct4me.net/Ohio_Graduation_Math_Test_Prep_AlgebraStrand.htm


Directions:

1. Identify the benchmark (A-J) below for review in Patterns, Functions, and Algebra. Below the benchmark, you will find Web resources for reviewing the concept and practice problems. As you work, add some notes in the box containing the resource.
2. *Before beginning the Web exercises* for the benchmark you chose, fill in the “K” column: What do you already know about that benchmark? Then in the “W” column: Write what you still want to know.
3. When you have completed using a resource provided, place a check in the box in the first column. This will help you keep track of resources used. Decide if the resource was helpful. Write “yes” or “no” in the last column. Add your comments, if any, about the resource.
4. *After using all the resources* for each benchmark, go to the “L” column and write what you learned. Read your “K” column entries again to see if any of your prior knowledge was inaccurate, and rewrite those statements so that they are correct.
5. Look at the “W” column again, and place a check next to any of your questions that were not answered by using the resources. Be sure to mention those questions in class. Decide how you will find answers to those remaining questions.
6. *When you have completed all of the exercises provided with each benchmark and your K-W-L chart is complete*, reflect on your overall understanding of the benchmark. Be honest with yourself. In the last column circle your belief about your level of mastery: still no or very little understanding (N), some to a great deal of progress (P), I’ve got it!--mastery (M).

Name _____


A. Generalize and explain patterns and sequences in order to find the next term and the nth term.		Circle Mastery Level: N P M
What I K now	What I W ANT to know	What I L earned
Check when completed	Resources	Was the resource helpful? (yes/no) Comment(s)
	Purplemath: Number Patterns	
	Mathguide.com: <ul style="list-style-type: none"> • Identifying arithmetic sequences • Quizmaster for finding the formula for the general term in the arithmetic sequence (fill in and check answer). 	

Name _____

	 Play video at YouTube.com: Recognizing Patterns : Review arithmetic, geometric, powers, inductive reasoning patterns	
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B. Identify and classify functions as linear or nonlinear, and contrast their properties using tables, graphs or equations.		Circle Mastery Level: N P M
What I K now	What I W ANT to know	What I L earned
Check when completed	Resources	Was the resource helpful? (yes/no) Comment(s)
	Purplemath: Functions	

Name _____

	 Play video at YouTube.com: Introduction to Linear Functions illustrates the concept and how linear functions represent a constant rate of change.	
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C. Translate information from one representation (words, table, graph or equation) to another representation of a relation or function.		Circle Mastery Level: N P M
What I K now	What I W ANT to know	What I L earned
Check when completed	Resources	Was the resource helpful? (yes/no) Comment(s)
	Purplemath: Translating Word Problems Keywords	

Name _____


D. Use algebraic representations, such as tables, graphs, expressions, functions and inequalities, to model and solve problem situations.		Circle Mastery Level: N P M
What I K now	What I W ANT to know	What I L earned
Check when completed	Resources	Was the resource helpful? (yes/no) Comment(s)
	<p>Mathguide.com: The quizmaster for each of the following is fill in and check answers:</p> <ul style="list-style-type: none"> • Add quadratic trinomials • Subtract quadratic trinomials • Multiply binomials with terms in the form $ax + b$ 	

Name _____


	<p>OnlineMathLearning.com: Types of Algebra Word Problems Among those are complete explanations and how to's for age, average, coin, consecutive integer, distance, fraction, geometry, interest, lever, mixture, number sequences, ratio, proportion, symbol, and work problems.</p>	
	<p>Purplemath: Translating Word Problems Applications</p>	

	<p> Play the YouTube videos from the Ohio Resource Center Tutorials for High School Mathematics:</p> <ul style="list-style-type: none">• Mixture and Concentration Problems for setting up and solving mixture and concentration problems with science examples.• Using Rates and Proportions for working with unit rates, ratios, and proportions.	
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Name _____

	<p> Play videos from Khan Academy:</p> <ul style="list-style-type: none">• Age Word Problems• Mixture Problems 1 (Coffee mixture) posted at YouTube• Mixture Problems 2 (Salt solution)• Mixture Problems 3 (Sugar solution)• Sums of consecutive integers. Find the integers.• Rectangle area and perimeter word problems	
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Name _____

	<p> Play videos at YouTube.com</p> <ul style="list-style-type: none">• Distance = Rate x Time (Airplanes traveling in opposite directions)• Coins (coins consisting of dimes and nickels)• Rate of Work Problems (How much time does it take to complete the job if two people or things work together?)• Investments (Use Interest = Principal x Rate: Money was invested, part at one rate and part at another rate. The total interest in one year is provided. How much was invested at each rate?)	
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Name _____

E. Analyze and compare functions and their graphs using attributes, such as rates of change, intercepts and zeros.		Circle Mastery Level: N P M
What I K now	What I W ANT to know	What I L earned
Check when completed	Resources	Was the resource helpful? (yes/no) Comment(s)
	Purplemath: Graphing Overview	
	Shodor Interactivate, Virtual Manipulative: Function Flyer -- plot an algebraic function on the coordinate plane, and use sliders to manipulate the constants of the graphed function.	

Name _____

F. Solve and graph linear equations and inequalities.		Circle Mastery Level: N P M
What I K now	What I W ANT to know	What I L earned
Check when completed	Resources	Was the resource helpful? (yes/no) Comment(s)
	Mathguide.com: Solve linear equations of the form $ax + b = c$; $ax + b + cx + d$; and $ax + b = cx + d$. The page contains explanations and quizmaster for each type. Fill in and check answers.	
	Purplemath: <ul style="list-style-type: none"> • Graphing Linear Equations • Graphing Linear Inequalities 	
	The Math Page: Algebra, Section 32, Equation of a straight line , including graphing using intercepts, $y = ax$, and lines parallel to axes, explanations, plus problems with answers	

Name _____

	<p>Shodor Interactivate:</p> <ul style="list-style-type: none">• Algebra Quiz: Practice solving algebraic equations. The quiz allows you to select the difficulty level, time limit and equation type. Choose to include one or more options: variable on both sides, distributive property, quadratic, one-step problems, and two-step problems. • Graphit: Graph linear equations and inequalities. <p> Play videos at YouTube.com:</p> <ul style="list-style-type: none">• Paired Data and the Rectangular Coordinate: graph linear equations using x- and y- intercepts; ordered pairs satisfying the equation.	
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Name _____


	<ul style="list-style-type: none"> • Solve and graph the linear inequality in one variable: Reviews rule for division by a negative integer when solving • Graph inequalities in two variables 	
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G. Solve quadratic equations with real roots by graphing, formula and factoring.		Circle Mastery Level: N P M
What I K now	What I W ANT to know	What I L earned

Name _____

Check when completed	Resources	Was the resource helpful? (yes/no) Comment(s)
	<p>Mathguide.com:</p> <ul style="list-style-type: none">• Solving quadratic equations with the formula. Formula is presented. Quizmaster presents the quadratic equation. Fill in answers rounded to nearest tenth and check answers. • Practice factoring quadratic trinomials with integer coefficients $ax^2 + bx + c$ where $a = 1$ or $a > 1$. Fill in and check answers.	
	<p>The Math Page: Algebra, Section 36, Solve Quadratic Equations by graphing, formula, factoring, explanations, plus problems with answers</p>	
	<p>Purplemath: Solving Quadratic Equations</p>	

Name _____


	<p> Play videos at YouTube.com:</p> <ul style="list-style-type: none">• Solve a simple Quadratic Equation with no linear term (solve by square root method) • Factoring Quadratics with a Common Factor • Solve Quadratics by Factoring (includes reminder to set equation =0 as a first step) • Solve Quadratic Equations using Quadratic Formula • Solving Quadratic Equations by Graphing includes three examples.	
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Name _____

	<ul style="list-style-type: none"> • Completing the Square - Solving Quadratic Equations [Note, while completing the square is one method for solving the quadratic equation, it is not one that is expected for mastery on this benchmark] 	
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H. Solve systems of linear equations involving two variables graphically and symbolically.		Circle Mastery Level: N P M
What I K now	What I W ANT to know	What I L earned
Check when completed	Resources	Was the resource helpful? (yes/no) Comment(s)
	Mathguide.com: Solve systems of linear equations with addition, multiplication/addition, and substitution. Lesson and then quizmaster. Fill in and check answers.	

Name _____


	Purplemath: Systems of Linear Equations	
	The Math Page: Algebra, Section 33, Simultaneous Linear Equations , explanations for graphical, addition, substitution methods, plus problems with answers	
	 Play videos at YouTube.com: <ul style="list-style-type: none">• Solve Systems of Linear Equations by Substitution• Solve Systems of Linear Equations by Elimination (Part 1: you can add or subtract at step 1)• Solve Systems of Linear Equations by Elimination (Part 2: first find a common multiple for one variable in both equations, then add or subtract)	

Name _____

	<ul style="list-style-type: none"> • Solve Systems of Linear Equations by Graphing 	
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I. Model and solve problem situations involving direct and inverse variation.		Circle Mastery Level: N P M
What I K now	What I W ANT to know	What I L earned
Check when completed	Resources	Was the resource helpful? (yes/no) Comment(s)
	Purplemath: Direct, Joint, and Inverse Variation	

Name _____

	<p> Play videos at YouTube.com for solving algebra word problems.</p> <p>The presenter translates the word problem into the algebraic equation, discusses the problem, shows diagrams as needed, and presents the solution. He is very detailed--excellent how-to videos. Students: For a learning experience, pause the video after the problem is presented, then solve. Use the video to check your solution method:</p> <ul style="list-style-type: none">• Direct Variation (Application to wages earned) • Inverse Variation (F varies inversely with the square of M) • Direct and Inverse Variation in same problem (P varies directly with X and inversely with Y)	
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Name _____

J. Describe and interpret rates of change from graphical and numerical data. (Includes: Compute and interpret slope, midpoint, and distance given a set of ordered pairs.)		Circle Mastery Level: N P M
What I K now	What I W ANT to know	What I L earned
Check when completed	Resources	Was the resource helpful? (yes/no) Comment(s)
	Purplemath: Meaning of Slope and Y-Intercept	
	AlgebraLab.org: Algebra I: Distance and Midpoint Formulas. Study aids with examples and practice problems (short answer and T/F). Given two ordered pairs, determine length of a segment and midpoint. Given three ordered pairs, determine if the vertices form a right triangle.	

Name _____

Are you ready for the test?

1. Don't forget to [review and complete the Six Steps for Success, including the full online practice tests.](#)
2. Complete an [online OGT Practice Test.](#)

How did you do?

Score: _____ right out of _____ questions.



Look at the “W” column again for the benchmarks you chose to work on. List the questions you checked that you still have. For each of those, decide how you will find the answer.

What I still WANT to know—my unanswered questions	My Plan to Find the Answers

Name _____

Use this page for additional resources you use for test preparation. Write the benchmark.

Benchmark:		Circle Mastery Level: N P M
What I K now	What I W ANT to know	What I L earned
Check when completed	Resources	Was the resource helpful? (yes/no) Comment(s)