



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](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 \_\_\_\_\_

<b>A. Generalize and explain patterns and sequences in order to find the next term and the <math>n</math>th term.</b>		Circle Mastery Level: N            P            M
What I <b>K</b> now	What I <b>W</b> ANT to know	What I <b>L</b> earned
Check when completed	Resources	Was the resource helpful? (yes/no) Comment(s)
	Purplemath: <a href="#">Number Patterns</a>	
	Glencoe Online Study Tools, Mathematics, Algebra I, 2005, multiple choice practice: <ul style="list-style-type: none"> <li>• <a href="#">Arithmetic Sequences</a></li> <li>• <a href="#">Writing Equations from Patterns</a></li> </ul>	
	Mathguide.com: <ul style="list-style-type: none"> <li>• <a href="#">Identifying arithmetic sequences</a></li> </ul>	

Name \_\_\_\_\_

	<ul style="list-style-type: none"><li>• Quizmaster for <a href="#">finding the formula for the general term</a> in the arithmetic sequence (fill in and check answer).</li></ul>	
	 Play video at YouTube.com: <a href="#">Recognizing Patterns</a> : Review arithmetic, geometric, powers, inductive reasoning patterns	

Name \_\_\_\_\_

<b>B. Identify and classify functions as linear or nonlinear, and contrast their properties using tables, graphs or equations.</b>		Circle Mastery Level: N          P          M
What I <b>K</b> now	What I <b>W</b> ANT to know	What I <b>L</b> earned
Check when completed	Resources	Was the resource helpful? (yes/no) Comment(s)
	Purplemath: <a href="#">Functions</a>	
	Glencoe Online Study Tools, Mathematics, IMPACT Math, Course 3, multiple choice practice: <a href="#">Linear Relationships</a>	
	 Play video at PilotMath.com: <a href="#">Pilot Math Linear Functions</a> reviews the concept of slope.	


Name \_\_\_\_\_

<b>C. Translate information from one representation (words, table, graph or equation) to another representation of a relation or function.</b>		Circle Mastery Level: N            P            M
What I <b>K</b> now	What I <b>W</b> ANT to know	What I <b>L</b> earned
Check when completed	Resources	Was the resource helpful? (yes/no) Comment(s)
	Purplemath: <a href="#">Translating Word Problems Keywords</a>	
	Glencoe Online Study Tools, Mathematics, Algebra I, 2005, multiple choice practice: <a href="#">Writing Equations</a>	

Name \_\_\_\_\_

<b>D. Use algebraic representations, such as tables, graphs, expressions, functions and inequalities, to model and solve problem situations.</b>		Circle Mastery Level: N            P            M
What I <b>K</b> now	What I <b>W</b> ANT to know	What I <b>L</b> 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"> <li>• <a href="#">Add quadratic trinomials</a></li>   <li>• <a href="#">Subtract quadratic trinomials</a></li>   <li>• <a href="#">Multiply binomials</a> with terms in the form <math>ax + b</math></li> </ul>	

Name \_\_\_\_\_

	<p>OnlineMathLearning.com: <a href="#">Types of Algebra Word Problems</a> 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: <a href="#">Translating Word Problems Applications</a></p>	
	<p> • Play videos at YouTube.com. 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"><li>• <a href="#">Use perimeter of the rectangle</a>. Find dimensions of the rectangle.</li><li>• <a href="#">Sum of three consecutive odd integers</a>. Find the integers.</li></ul>	

Name \_\_\_\_\_

	<ul style="list-style-type: none"><li>• <a href="#">Distance = Rate x Time</a> (Airplanes traveling in opposite directions)</li> <li>• <a href="#">Mixture</a> (Salt solution)</li> <li>• <a href="#">Coins</a> (26 coins in your pocket consisting of dimes and quarters)</li> <li>• <a href="#">Work</a> (How much time does it take to complete the job if two people work together to paint a fence?)</li> <li>• <a href="#">Investments</a> (Use Interest =Principal x Rate: An investment consisted of stocks and bonds and earned interest in one year. How much was invested in stocks? in bonds?)</li></ul>	
--	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--



Name \_\_\_\_\_

<b>E. Analyze and compare functions and their graphs using attributes, such as rates of change, intercepts and zeros.</b>		Circle Mastery Level: N            P            M
What I <b>K</b> now	What I <b>W</b> ANT to know	What I <b>L</b> earned
Check when completed	Resources	Was the resource helpful? (yes/no) Comment(s)
	Purplemath: <a href="#">Graphing Overview</a>	
	Shodor Interactivate, Virtual Manipulative: <a href="#">Function Flyer</a> -- 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 Know	What I WANT to know	What I Learned
Check when completed	Resources	Was the resource helpful? (yes/no) Comment(s)
	Mathguide.com: <a href="#">Solve linear equations</a> 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"> <li>• <a href="#">Graphing Linear Equations</a></li> <li>• <a href="#">Graphing Linear Inequalities</a></li> </ul>	
	The Math Page: Algebra, Section 32, <a href="#">Equation of a straight line</a> , including graphing using intercepts, $y = ax$ , and lines parallel to axes, explanations, plus problems with answers	


Name \_\_\_\_\_

	<p>Glencoe Online Study Tools, Mathematics, Algebra I, 2005, multiple choice practice:</p> <ul style="list-style-type: none"><li>• <a href="#">Graphing Linear Equations</a></li>          <li>• <a href="#">Graphing Inequalities</a></li>          <li>• <a href="#">Solve equations for a variable</a></li>          <li>• <a href="#">Solve multi-step equations</a></li>          <li>• <a href="#">Solving equations with variables on each side</a></li></ul>	
--	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--

Name \_\_\_\_\_

	<ul style="list-style-type: none"><li>• <a href="#">Solve multi-step inequalities</a>, including those with variables on both sides</li></ul>	
	Glencoe Online Study Tools, IMPACT Mathematics, Course 3, multiple choice practice: <a href="#">Solve inequalities</a> symbolically and graphically, including word problems	
	Shodor Interactivate: <ul style="list-style-type: none"><li>• <a href="#">Algebra Quiz</a>: 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.</li> <li>• <a href="#">Graphit</a>: Graph linear equations and inequalities.</li></ul>	

Name \_\_\_\_\_

	<p> Play videos at YouTube.com:</p> <ul style="list-style-type: none"><li>• <a href="#">Paired Data and the Rectangular Coordinate</a>: graph linear equations using x- and y- intercepts; ordered pairs satisfying the equation.</li> <li>• <a href="#">Solve and graph the linear inequality in one variable</a>: Reviews rule for division by a negative integer when solving</li> <li>• <a href="#">Graph inequalities in two variables</a></li></ul>	
--	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--



Name \_\_\_\_\_

<b>G. Solve quadratic equations with real roots by graphing, formula and factoring.</b>		Circle Mastery Level: N            P            M
What I <b>K</b> now	What I <b>W</b> ANT to know	What I <b>L</b> earned
Check when completed	Resources	Was the resource helpful? (yes/no) Comment(s)
	Mathguide.com: <ul style="list-style-type: none"> <li>• <a href="#">Solving quadratic equations with the formula</a>. Formula is presented. Quizmaster presents the quadratic equation. Fill in answers rounded to nearest tenth and check answers.</li> <li>• <a href="#">Practice factoring quadratic trinomials</a> with integer coefficients <math>ax^2 + bx + c</math> where <math>a = 1</math> or <math>a &gt; 1</math>. Fill in and check answers.</li> </ul>	
	The Math Page: Algebra, Section 36, <a href="#">Solve Quadratic Equations</a> by graphing, formula, factoring, explanations, plus problems with answers	

Name \_\_\_\_\_

	Purplemath: <a href="#">Solving Quadratic Equations</a>	
	Edmonton Public Schools (CA), Jim Reed, Math 9: Interactive <a href="#">Quadratic Formula and Sum/Product Method</a>	
	Mercer Community College, Debbie Kell, multiple choice practice: <a href="#">Solve Quadratic Equations by Factoring and Applications</a>	
	Glencoe Online Study Tools, Mathematics, IMPACT Math, Course 3, multiple choice practice: <ul style="list-style-type: none"><li>• <a href="#">Quadratic Formula Use</a></li><li>• <a href="#">Solve Quadratics by Factoring</a></li></ul>	
	Glencoe Online Study Tools, Algebra I, 2005, multiple choice practice: <a href="#">Solving Quadratic Equations by Graphing</a>	

Name \_\_\_\_\_

	<p> Play videos at YouTube.com:</p> <ul style="list-style-type: none"><li>• <a href="#">Solve a simple Quadratic Equation with no linear term</a> (solve by square root method)</li><li>• <a href="#">Solve Quadratics by Factoring #1</a> (common factor is present)</li><li>• <a href="#">Solve Quadratics by Factoring #2</a> (reminder to set equation =0 as a first step)</li><li>• <a href="#">The Quadratic Formula</a>: How to solve a quadratic equation using the formula</li></ul>	
	<p> Play videos at Mefedia.com [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]:</p> <ul style="list-style-type: none"><li>• <a href="#">GCSE maths Tutor no.3 completing the square part 1</a> --how to solve quadratics by completing the square method</li><li>• <a href="#">GCSE Maths Tutor no.4 completing the square part 2</a> --common examples of the use of completing the square for the solution of quadratic equations</li></ul>	




Name \_\_\_\_\_

<b>H. Solve systems of linear equations involving two variables graphically and symbolically.</b>		Circle Mastery Level: N            P            M
What I <b>K</b> now	What I <b>W</b> ANT to know	What I <b>L</b> earned
Check when completed	Resources	Was the resource helpful? (yes/no) Comment(s)
	Mathguide.com: <a href="#">Solve systems of linear equations</a> with addition, multiplication/addition, and substitution. Lesson and then quizmaster. Fill in and check answers.	
	Purplemath: <a href="#">Systems of Linear Equations</a>	
	The Math Page: Algebra, Section 33, <a href="#">Simultaneous Linear Equations</a> , explanations for graphical, addition, substitution methods, plus problems with answers	

Name \_\_\_\_\_

	<p>Glencoe Online Study Tools, Algebra I, 2005, multiple choice practice:</p> <ul style="list-style-type: none"><li>• <a href="#">Graphing Systems of Equations</a></li> <li>• <a href="#">Graphing Systems of Linear Inequalities</a></li></ul>	
	<p>Glencoe Online Study Tools, IMPACT Mathematics, Course 3, multiple choice practice: Solve symbolically <a href="#">Systems of Linear Equations</a></p>	
	<p><a href="#">Systems of Linear Equations</a> drill by Elias Saab and Daniel Saab. Enter the ordered pair for the answer. Feedback tells correct answer, but not the complete details to solution. Select from five levels of difficulty with either two, three, or four variables in the problem.</p>	


Name \_\_\_\_\_

	<p> Play videos at YouTube.com:</p> <ul style="list-style-type: none"><li>• <a href="#">Solving Systems of Linear Equations:</a> an overview of the three methods.</li> <li>• <a href="#">Solve Systems of Linear Equations by Substitution</a></li> <li>• <a href="#">Solve Systems of Linear Equations by Elimination</a> (Part 1: you can add or subtract at step 1)</li> <li>• <a href="#">Solve Systems of Linear Equations by Elimination</a> (Part 2: first find a common multiple for one variable in both equations, then add or subtract)</li> <li>• <a href="#">Solve Systems of Linear Equations by Graphing</a></li></ul>	
--	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--

Name \_\_\_\_\_

<b>I. Model and solve problem situations involving direct and inverse variation.</b>		Circle Mastery Level: N            P            M
What I <b>K</b> now	What I <b>W</b> ANT to know	What I <b>L</b> earned
Check when completed	Resources	Was the resource helpful? (yes/no) Comment(s)
	Purplemath: <a href="#">Direct, Joint, and Inverse Variation</a>	
	Glencoe Online Study Tools, Algebra I, 2005, multiple choice practice: <ul style="list-style-type: none"> <li>• <a href="#">Slope and Direct Variation</a></li>   <li>• <a href="#">Inverse Variation</a></li> </ul>	

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"><li>• <a href="#">Direct Variation</a> (Application to wages earned)</li> <li>• <a href="#">Inverse Variation</a> (F varies inversely with the square of M)</li> <li>• <a href="#">Direct and Inverse Variation</a> in same problem (P varies directly with X and inversely with Y)</li></ul>	
--	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--

Name \_\_\_\_\_

<b>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.)</b>		Circle Mastery Level: N            P            M
What I <b>K</b> now	What I <b>W</b> ANT to know	What I <b>L</b> earned
Check when completed	Resources	Was the resource helpful? (yes/no) Comment(s)
	Purplemath: <a href="#">Meaning of Slope and Y-Intercept</a>	
	Glencoe Online Study Tools, Algebra I, 2005, multiple choice practice: <a href="#">Slope</a>	
	AlgebraLab.org: Algebra I: <a href="#">Distance and Midpoint</a> 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: Algebra and Functions Strand Questions using [California's High School Exit Examination \(CAHSEE\) released questions.](#)



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 <b>WANT</b> 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 <b>K</b> now	What I <b>W</b> ANT to know	What I <b>L</b> earned
Check when completed	Resources	Was the resource helpful? (yes/no) Comment(s)