



Computing Technology for Math Excellence

Preparing for the Ohio Graduation Test in Mathematics

Strand Resources: Geometry and Spatial Sense

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_GeometryStrand.htm

Directions:

1. Identify the benchmark (A-I) below for review in Geometry and Spatial Sense. Below the benchmark, you will find Web resources for reviewing the concept and practice problems.
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 _____

NOTE: As general resources for all Geometry and Spatial Sense benchmarks, students might consult the following:

- [Geometry](#) from Oswego City School District (NY) Regents Exam Prep Center. Each sub-section includes lessons and interactive practice exercises. Sections address geometric relationships, constructions, locus, formal and informal proofs, transformations, and coordinate geometry.
- [Math Open Reference](#) is a free geometry textbook for high school learners. There are topics in plane geometry, coordinate geometry, and solid geometry (e.g., cylinders, cubes). Its focus is on using interactive materials and animations to develop concepts. Students can manipulate numerous interactive applets with at least one accompanying nearly every concept that is presented.

A. Formally define geometric figures.		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 Web resource helpful? (yes/no) Comment(s)
	Learner.org: Glossary of key geometry terms	

Name _____

	Math.com: Geometry basics. Figures are defined with lessons, examples, workout quizzes, and unit quizzes	
	Mathwords.com: interactive math dictionary with words, terms, formulas, pictures, diagrams, tables, and examples	
	Explore Learning Gizmos (Virtual Manipulatives): Quadrilaterals and other Polygons .	
	Geometry 3-D Shapes is one of the Interactives from Annenberg Media's Learner.org. Learn about three-dimensional shapes, calculate surface area and volume, and discover some of the mathematical properties of shapes. Use the tutorials and take the interactive test.	

Name _____

B. Describe and apply the properties of similar and congruent figures; and justify conjectures involving similarity and congruence.		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 Web resource helpful? (yes/no) Comment(s)
	Edmonton Public Schools (CA), Jim Reed, Math 9: Similar and Congruent Triangles	
	AlgebraLab.org: Lesson and fill in the blank practice problems, including word problems. Be sure to show the related AlgebraLab documents for additional practice problems on each topic. <ul style="list-style-type: none"> • Congruent Triangles 	


Name _____

	<ul style="list-style-type: none">• Similar Triangles	
	Mathleague.com: Describe similar and congruent figures	
	Math.com: Congruent and similar figures including lesson and workout problems	

Name _____

	<p>NCTM Illuminations: Congruence Theorems Applet. Use this virtual manipulative to investigate congruence by manipulating the sides and angles of a triangle.</p>	
	<p>Utah State University, National Library of Virtual Manipulatives: investigate methods for determining congruent triangles. Explore SSS, SAS, ASA, SSA. Note SSA does not guarantee congruent triangles.</p>	

Name _____

	<p> Play videos at YouTube.com:</p> <ul style="list-style-type: none">• Similar Triangles illustrates the definition. Example is used to solve a problem of two triangles formed from by two parallel lines cut by two intersecting lines. This was posted from Nutshellmath.com • Proving Triangles Congruent explores 5 methods to show congruence: SSS, SAS, ASA, AAS, and HL in right triangles. This shows use of the two-column proof method: Statement/Reason. This was posted from Nutshellmath.com	
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Name _____

C. Recognize and apply angle relationships in situations involving intersecting lines, perpendicular lines and parallel lines.		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 Web resource helpful? (yes/no) Comment(s)
	<p>AlgebraLab.org: Lesson and fill in the blank practice problems. Be sure to show the related AlgebraLab documents for additional practice problems on each topic.</p> <ul style="list-style-type: none"> • Parallel Lines and Transversals 	


Name _____

	<ul style="list-style-type: none">• Slope of Parallel and Perpendicular Lines	
	Math.com: Angles and Intersecting Lines including lesson and workout problems	
	AmbleWeb, Virtual Manipulative: 20 Virtual Protractor Angle Activities -- investigate sum of interior and exterior angles in polygons, supplementary angles, angles created by parallel lines and a transversal, vertical angles, and so on.	

Name _____

	<p>NCTM Illuminations: Angle Sums Applet. Use this virtual manipulative to examine the angles in a triangle, quadrilateral, pentagon, hexagon, heptagon or octagon. The purpose is to find a relationship between the number of sides and the sum of the interior angles of the polygon.</p>	
	<p>Shodor Interactivate, Virtual Manipulative: Angles formed by parallel lines and one or two transversals</p>	


Name _____

	<p>W. Fendt's Sum of Angles in a Triangle, Virtual Manipulative</p>	
	<p> Play the video tutorial at the Ohio Resource Center for Mathematics, Science, and Reading:</p> <ul style="list-style-type: none">• Parallel lines, polygons, and the Pythagorean Theorem for finding values for alternate interior angles, finding values for the exterior angles of regular polygons, and using the Pythagorean theorem, video #6.	

Name _____

D. Use coordinate geometry to represent and examine the properties of geometric figures.		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 Web resource helpful? (yes/no) Comment(s)
	<p>Glencoe Online Study Tools, Geometry 2004, multiple choice practice:</p> <ul style="list-style-type: none"> • Triangles and Coordinate Proof • Coordinate Proof and Quadrilaterals 	

Name _____

	<p>Holt, Rinehart, Winston, Geometry, section 5.7 homework help: Proofs in Coordinate Geometry determine when to use distance, slope, or midpoint formula.</p>	
	<p>Math Warehouse: Using the coordinate plane in proofs is an interactive demonstrating how to do coordinate proofs. Do the proofs (perpendicular segments, trapezoid is not isosceles, and rectangle) and see the answers.</p>	
	<p> Play video at YouTube.com: Coordinate Proofs. Mr. Vahn demonstrates how to set up the coordinate proof in general; then he shows how to prove that the medians to the legs of an isosceles triangle are congruent.</p>	

Name _____

E. Draw and construct representations of two- and three-dimensional geometric objects using a variety of tools, such as straightedge, compass and technology.		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 Web resource helpful? (yes/no) Comment(s)
	Mathematics Open Reference: Visual demonstrations of how to do various Euclidean constructions with compass and straightedge .	
	Oswego City School District (NY), Regents Prep, new Geometry section: Constructions	


Name _____

	<p>Virtual manipulative: Explore the net for a pyramid with rectangular base. You can modify the length, width, and height in this JAVA applet by Pavel Safronov (MSTE division at University of Illinois-Urbana-Champaign).</p>	
	<p>Virtual manipulative: Explore building "houses" with cubes, given the top, front, and right side views. This activity builds 3-D spatial abilities. This JAVA applet is from the Freudenthal Institute.</p>	

Name _____

F. Represent and model transformations in a coordinate plane and describe the results.		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 Web resource helpful? (yes/no) Comment(s)
	Edmonton Public Schools (CA), Jim Reed, Math 9: Transformations (Translations, Rotations, Reflections, Dilations)	
	Glencoe Online Study Tools, Geometry Concepts and Applications 2004, multiple choice practice: <ul style="list-style-type: none"> • Translations • Reflections • Rotations • Dilations 	

Name _____

	<p>Utah State University, National Library of Virtual Manipulatives: show axes, create objects with pattern block pieces, then apply and explore the following:</p> <ul style="list-style-type: none">• Translations • Reflections • Rotations • Effect of two transformations (Translations, Reflections, or Rotations) in any order.	
	<p>W. Fendt's Simple Geometric Transformations, Virtual Manipulative</p>	
	<p> Play video at YouTube.com: Transformations: Review reflections and translations. This was posted from Nutshellmath.com</p>	


Name _____

G. Prove or disprove conjectures and solve problems involving two- and three-dimensional objects represented within a coordinate system.		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 Web resource helpful? (yes/no) Comment(s)
	<p>Glencoe Online Study Tools, Geometry Concepts and Applications 2004, multiple choice practice:</p> <ul style="list-style-type: none"> • Distance on the Coordinate Plane • Midpoints • Coordinate Proofs 	
	<p>Utah State University, National Library of Virtual Manipulatives: Platonic Solids, Verify Vertices, Faces, Edges of five Solids</p>	


Name _____

H. Establish the validity of conjectures about geometric objects, their properties and relationships by counter-example, inductive and deductive reasoning, and critiquing arguments made by others.		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 Web resource helpful? (yes/no) Comment(s)
	Glencoe Online Study Tools, Geometry Concepts and Applications 2004, multiple choice practice: <ul style="list-style-type: none"> • Deductive Reasoning • Inductive Reasoning 	
	Utah State University, National Library of Virtual Manipulatives: walk through a visual proof of the Pythagorean theorem .	

Name _____

I. Use right triangle trigonometric relationships to determine lengths and angle measures.		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 Web resource helpful? (yes/no) Comment(s)
	Why is $a^2 + b^2 = c^2$ in the right triangle? See an easy proof from the MacTutor History of Mathematics archive. Or, explore the virtual manipulative .	
	 Play videos on sine, cosine, and tangent ratios at Mefeedia.com: <ul style="list-style-type: none"> • GCSE Maths Tutor no.5 the sine ratio: What is the sine ratio, plus an example. • GCSE Maths Tutor no.6 the cosine ratio: What is the cosine ratio, plus an example. 	

Name _____

	<ul style="list-style-type: none">• GCSE Maths Tutor no.7 the tangent ratio: What is the tangent ratio, plus an example. • GCSE Maths Tutor no.8 sine ratio problems: Three problems show use of sine ratio to find sides of a triangle using multiplication and division; then find an angle.	
	 Play the video tutorial at the Ohio Resource Center for Mathematics, Science, and Reading: Right Triangle Trig for reviewing trig definitions and applying trig in practical problems, video #22.	
	Glencoe Online Study Tools, Mathematics: Applications and Concepts, Course 3, multiple choice practice: Using the Pythagorean Theorem	

Name _____

	<p>Glencoe Online Study Tools, Geometry Concepts and Applications 2004, multiple choice practice:</p> <ul style="list-style-type: none">• Tangent Ratio • Sine and Cosine Ratios	
	<p>AlgebraLab.org: Lesson and fill in the blank practice problems.</p> <ul style="list-style-type: none">• Pythagorean Theorem lesson and exercises • Word problems with Pythagorean Theorem	
	<p>Mathguide.com: Pythagorean theorem quizmaster. The following are fill in and check answers, which are rounded to the nearest tenth. The formula is presented with the following:</p> <ul style="list-style-type: none">• Find the hypotenuse	

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	<ul style="list-style-type: none">• Find a leg in a right triangle.	
	Math.com: Right Triangle and Pythagorean Theorem including lesson and workout problems	
	Oswego City School District (NY), Regents Prep, new Algebra section: <ul style="list-style-type: none">• Pythagorean Theorem • Trigonometric Ratios finding sides, angles, and word problems.	

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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: Measurement and Geometry 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 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)