

## Grade 8 Math C1 TH

<p><b>Claim 1:</b> Concepts and Procedures Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.</p>	
<p>Content Domain: <b>Geometry</b></p>	
<p><b>Target H [m]:</b> Understand and apply the Pythagorean theorem. (DOK 2)</p> <p>Tasks associated with this target will ask students to use the Pythagorean theorem to solve real-world and mathematical problems in two and three dimensions, including problems that ask students to find the distance between two points in a coordinate system.</p> <p>Some applications of the Pythagorean theorem will be assessed at deeper levels in Claims 2 and 4. Understanding of the derivation of the Pythagorean theorem would contribute evidence to Claim 3.</p>	
Standards:	8.G.6, 8.G.7, 8.G.8
DOK Target(s):	2
Evidence Required:	<ol style="list-style-type: none"> <li>1. The student demonstrates understanding of the derivation of the Pythagorean theorem and its converse.</li> <li>2. The student solves real-world problems in two and three dimensions by applying the Pythagorean theorem and its converse.</li> <li>3. The student solves mathematical problems in two and three dimensions by applying the Pythagorean theorem and its converse.</li> <li>4. The student finds the distance between two points in a coordinate system by applying the Pythagorean theorem.</li> </ol>
Allowable Item Types*:	SR, CR
Task Models:	<ol style="list-style-type: none"> <li>1. SR (DOK 2) <b>Prompt Features:</b> The student is prompted to fill in missing parts of a proof of the Pythagorean theorem or its converse. <b>Stimulus:</b> The student is presented with various parts of the proof of the Pythagorean theorem or its converse.</li> <li>1. CR (DOK 2) <b>Prompt Features:</b> The student is prompted to fill in missing parts of a proof of the Pythagorean theorem or its converse to demonstrate understanding of its derivation. Or the student is prompted to explain a proof of the Pythagorean theorem or its converse. <b>Stimulus 1:</b> The student is presented with a proof of the Pythagorean theorem or its converse with some parts of the proof left out. <b>Stimulus 2:</b> The student is presented with a proof of the Pythagorean theorem or its converse and asked to provide reasons for the steps in the proof.</li> <li>2. SR (DOK 2) <b>Prompt Features:</b> The student is prompted to apply the</li> </ol>

	<p>Pythagorean theorem to identify an unknown side length of a right triangle. Or the student is prompted to use the converse of the Pythagorean theorem to identify whether triangles are right triangles.</p> <p><b>Stimulus 1:</b> The student is presented with various measurements in real-world diagrams or descriptions in two or three dimensions where the Pythagorean theorem must be used to determine missing sides of right triangles.</p> <p><b>Stimulus 2:</b> The student is presented with sets of three numbers that represent the sides of triangles in real-world diagrams or descriptions in two or three dimensions.</p> <p>2. CR (DOK 2)</p> <p><b>Prompt Features:</b> The student is prompted to apply the Pythagorean Theorem to determine an unknown side length of a right triangle. Or the student is prompted to show how to determine whether a triangle is a right triangle.</p> <p><b>Stimulus 1:</b> The student is presented with various measurements in real-world diagrams or descriptions in two or three dimensions where the Pythagorean theorem must be used to determine missing sides of right triangles.</p> <p><b>Stimulus 2:</b> The student is presented with a set of three numbers that represent the sides of a triangle in real-world diagrams or descriptions in two or three dimensions.</p> <p>3. SR (DOK 2)</p> <p><b>Prompt Features:</b> The student is prompted to apply the Pythagorean theorem to identify an unknown side length of a right triangle. Or the student is prompted to use the converse of the Pythagorean theorem to identify whether triangles are right triangles.</p> <p><b>Stimulus 1:</b> The student is presented with various measurements in pure mathematical contexts in two or three dimensions where the Pythagorean theorem must be used to determine missing sides of right triangles.</p> <p><b>Stimulus 2:</b> The student is presented with a set of three numbers that represent the sides of a triangle in pure mathematical contexts in two or three dimensions.</p> <p>3. CR (DOK 2)</p> <p><b>Prompt Features:</b> The student is prompted to apply the Pythagorean theorem to determine an unknown side length of a right triangle. Or the student is prompted to show how to determine whether a triangle is a right triangle. Or the student is prompted to provide three lengths that either do or do not make a right triangle and justify the conclusion.</p> <p><b>Stimulus 1:</b> The student is presented with various measurements in pure mathematical contexts in two or three dimensions where the Pythagorean theorem must be used to determine missing sides of right triangles.</p> <p><b>Stimulus 2:</b> The student is presented with a set of three</p>
--	---

	<p>numbers that represent the sides of a triangle in pure mathematical contexts in two or three dimensions.</p> <p><b>Stimulus 3:</b> The student is presented with instructions to determine the side lengths of a certain kind of triangle and justify the lengths chosen.</p> <p>4. SR</p> <p><b>Prompt Features:</b> The student is prompted to apply the Pythagorean theorem to identify the distance between two points in a coordinate system. Or the student is prompted to identify one or more points at, within, or beyond a given distance from a given point.</p> <p><b>Stimulus 1:</b> The student is presented with two points in a coordinate system where the Pythagorean theorem must be used to determine the distance between the points.</p> <p><b>Stimulus 2:</b> The student is presented with a point and a distance in a coordinate system.</p> <p>4. CR</p> <p><b>Prompt Features:</b> The student is prompted to apply the Pythagorean theorem to determine the distance between two points in a coordinate system. Or the student is prompted to find one or more points at a given distance from a given point that are not horizontal or vertical to the given point.</p> <p><b>Stimulus 1:</b> The student is presented with two points in a coordinate system where the Pythagorean theorem must be used to determine the distance between the points.</p> <p><b>Stimulus 2:</b> The student is presented with a point and a distance in a coordinate system.</p>
Allowable Stimulus Materials:	Two-dimensional representations of triangles, three-dimensional models that contain right triangles, and coordinate systems
Allowable Disciplinary Vocabulary:	Pythagorean theorem, converse, leg, hypotenuse, right triangle, base, height
Allowable Tools:	Calculator
Key Nontargeted Constructs:	It is expected that students will know the coordinate system to assess evidence statement 4.
Target-Specific Attributes:	The size of the coordinate system must be considered for items that involve the use of coordinate systems.
Accessibility Concerns:	Problems may require that diagrams be presented in tactile form. Some items may not be accessible for blind/low vision students.
Sample Items:	MAT.08.CR.1.0000G.H.002, MAT.08.SR.1.0000G.H.143

\*SR = selected-response item; CR = constructed-response item; TE = technology-enhanced item; ER = extended-response item; PT = performance task