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| **Content: Applying the Pythagorean Theorem to Solve Problems** | | | |
| Describes how to use the Pythagorean theorem  I can substitute the known side lengths into *a*2 + *b*2 = *c*2, where *a* and *b* are the lengths of the shorter sides and *c* is the length of hypotenuse, to find the unknown length in a right triangle. | Uses Pythagorean triples to solve a problem    Since 102 – 82 = 36 is a perfect square, the side lengths are a Pythagorean triple.  The missing side length is 6 cm. | Uses the Pythagorean theorem to determine an unknown side length    *a*2 + *b*2 = *c*2  *a* 2 + 702 = 902  *a* 2 + 4900 = 8100  *a*2 = 8100 – 4900  *a*2 = 3200  *a* =  *a* ≈ 56.6  The unknown side length is about 56.6 cm. | Uses the Pythagorean theorem to solve problems involving an unknown side length in a right triangle  A surveyor measures the base of a vertical cliff to be 150 m away and the top of the cliff to be 188 m away. How high is the cliff?  Draw a diagram.    *a*2 + *b*2 = *c*2  *a* 2 + 1502 = 1882  *a* 2 + 22 500 = 35 344  *a*2 = 35 344 – 22 500  *a*2 = 12 844  *a* =  *a* ≈ 113.33  The height of the cliff is about 113.33 m. |
| **Observations/Documentation** | | | |
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| **Competency: Problem Solving** | | | |
| Recognizes that a problem involves a right triangle  A family is building a tree fort. They have a ladder that is 3.5 m long. The bottom of the ladder is placed 1.2 m from the base of the tree. How high up the tree will the ladder reach?  “The problem involves a right triangle. The angle between the ground and the tree is a right angle. The ladder represents the hypotenuse of the triangle.” | Draws and labels a diagram that represents the problem, or interprets a given diagram    “The tree, ground, and ladder form a right triangle.” | Records an equation that can be used to solve the problem  “Let *b* represent the height of the tree in metres.  I can represent the problem with the equation:  1.22 + *b*2 = 3.52” | Flexibly solves the equation to solve the problem, interprets the solution, and confirms that the solution is reasonable  1.22 + *b*2 = 3.52  1.44+ *b*2 = 12.25  *b*2 = 12.25 – 1.44  *b*2 = 10.81  *b* =  *b* ≈ 3.3  “The ladder will reach about 3.3 m  up the tree.  This seems reasonable because it is less than the hypotenuse, which is always the longest side.” |
| **Observations/Documentation** | | | |
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