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The Calculating Angle and Side Values Using the Tangent Ratio (A) Math Worksheet Page 1 The Calculating Angle and Side Values Using the Tangent Ratio (A) Math Worksheet Page 2 Other Versions: More Geometry Worksheets Home > Grade Levels > High School Geometry > What are Tangent Ratios? When early mathematicians and astronomers pondered, trigonometry got its start. They focused on the studies of ratios of certain lengths and identified some interesting things about trigonometry. If you haven't got a grasp of what tangent ratios are, let's look at the definition, and then it will make a lot more sense to you. Used with right triangles, a tangent ratio is a tool that assists in finding the length of the sides of a triangle, provided the degree of its angles. It also helps in figuring the triangles' angles, given the length of two of its sides. In a right triangle, the angles measuring are 90 degrees. Every right triangle has only two angles that are not right angles, as well as two sides that are not the hypotenuse. A tangent ratio refers to a comparison between the non-hypotenuse sides of a right triangle. In two different triangles that have a congruent angle but not a right angle, the quotient of the lengths of two non-hypotenuse sides will yield the same value. To put it simply, the tangent ratio is just an easier way of discovering the lengths of the sides of a right triangle. These worksheets and lessons show students how to the tangent ratio as a tool with right triangles to find missing lengths of triangle sides. Aligned Standard: High School Geometry - HSG-SRT.C.6 /Answer Keys - These are for all the unlocked materials above. These problems progress towards becoming full blown word problems. Homework 1 - Tangent Ratio: for any acute angle θ of a right triangle. Homework 2 - Practice writing tangent ratios. Write each trigonometric ratio. Homework 3 - You're flying a balloon that is 100 feet high. The balloon string makes a 40 degrees angle from the ground, find the length of the balloon string to the nearest foot. I tried to add little visuals to make these more realistic. Practice 1 - The angle of elevation from point 57 feet from the base of a building you need to look up at 55 degrees to see the top of a building. What is the height of the building? Practice 2 - If the angle of elevation to the top of the kite is 65 degrees. How far are you away from the kite, if the kite height is 27 feet? Now set up tangent ratio and solve for a side length? Practice 3 - A ladder leaning against a wall makes an angle 60 degrees, with the ground. If the length of the wall to the ground is 19m, find the distance of the foot of the ladder from the wall. We will use fractions, decimals, and units of length to express the outcomes. Quiz 1 - In a right angle triangle, the side adjacent to the 35 degrees angle is 19 cm long. What is the length of the side opposite the 35 degrees angle to the nearest centimeter? Quiz 2 - A tower 60 feet high and casts a shadow that is 20 feet long. What is the angle of elevation from the end of the shadow to the top of the tower with respect to the ground? Quiz 3 - Use these right triangle scenarios. Gain a solid foundation on trigonometry with our worksheets, complete with answer keys. Practice identifying the hypotenuse, opposite, and adjacent sides, determining the six trigonometric ratios like sine, cosine, and tangent and their inverses using charts and calculator, and calculating trigonometric ratios using unit circles measured in degrees and radians. 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