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Is 2 Truly Greater Than 1?

Two best friends, Cody and Dustin, want to purchase a mode of transportation to get to and from school this year. Cody wants to buy a brand new bicycle while Dustin wants to try his luck on a unicycle. Dustin argues that Cody is wasting money on a bicycle and that his unicycle will be more cost efficient. At a local garage sale, Cody found a bicycle for $40 and Dustin found his unicycle for only $30. Since neither of them came with wheels, Dustin and Cody had to purchase their own. Dustin found a website promoting $15 per wheel and tires that cost 35 cents per inch. Knowing this is a competition, Cody found a website that offered wheels at $8 a piece and tires for 25 cents per inch.

1. Create two equations, one for Cody and for Dustin, that calculates the total cost of their purchases, C, in terms of the number of wheels required, w, and the size of the tire, t, and the initial cost, i.

*CB =*

*CU =*

1. Cody decided that he needs two wheels that are 26 inches in diameter to accommodate his bicycle while Dustin needs one wheel that is 30 inches in diameter for his unicycle. Use Geogebra to:
   1. Create a model of each wheel, labeling the owner of the wheel and its diameter.
   2. Calculate and label the circumference of each wheel. Make sure you include the equation you used to calculate the circumference!
   3. Use the data to determine the cost of each tire. Make sure you include the equation you used to calculate the cost!
   4. Print off your representations.
2. Use your two equations and the previous data to determine who purchased the more cost efficient mode of transportation, check your answer at the bottom of the page.
3. Create a generalized equation to determine the cost for any bicycle where the cost of a tire is 25 cents per inch. Also create one for a unicycle where the cost of a tire is 35 cents. Let *i* be the initial cost, *a* be the cost of a wheel, *x* be the number of wheels needed for the any mode of transportation (unicycle, bicycle, tricycle, etc.).
4. E.C. Explain the differences between the bicycle’s tire and wheels and the unicycle’s tire and wheel.