RIDING ON THE FERRIS WHEEL LEARNING TASK:

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| Expectations | R | 1 | 2 | 3 | 4 |
| Understand and apply radian measure |  |  |  |  |  |
| Connecting graph and equations of trigonometric functions |  |  |  |  |  |
| Solve problems involving trigonometric equations and prove trigonometric identities |  |  |  |  |  |

Angie is riding a Ferris wheel with a radius of 40 feet. The center of the wheel is 55 feet off of the ground, the wheel is turning counter clockwise, and Angie is halfway up the Ferris wheel, on her way up. Draw a picture of this situation with Angie’s position and all measurements labeled.

1. If the wheel makes a complete turn every 1.5 minutes, through what angle, in radians, does the wheel turn each second?
2. Draw a picture showing Angie’s position 10 seconds after passing her position in problem 1? What height is Angie at in this picture?
3. Draw a picture showing Angie’s position 20 seconds after passing her position in problem 1? What height is Angie at in this picture?
4. Draw a picture showing Angie’s position 40 seconds after passing her position in problem 1? What height is Angie at in this picture?
5. Write an expression that gives Angie’s height t seconds after passing her position in problem 1, in terms of t.
6. In problems 4 and 5, the angle through which Angie turned was twice that of the problem before it. Did her change in height double as well?
7. Explain how the double angle identities for sine and cosine correspond with the questions being asked in this task? (You might need to Google “double angle identities” to better understand this question)
8. Explain how the double angle identities can be derived from the angle sum identities.
9. Create your own “Ferris wheel problem” that is different from the one above about Angie’s Ferris wheel trip. Then ask and answer several meaningful questions about your problem.