## Unit 6 Lesson 12: Tangent

### 1 Notice and Wonder: An Unusual Function (Warm up)

#### Student Task Statement

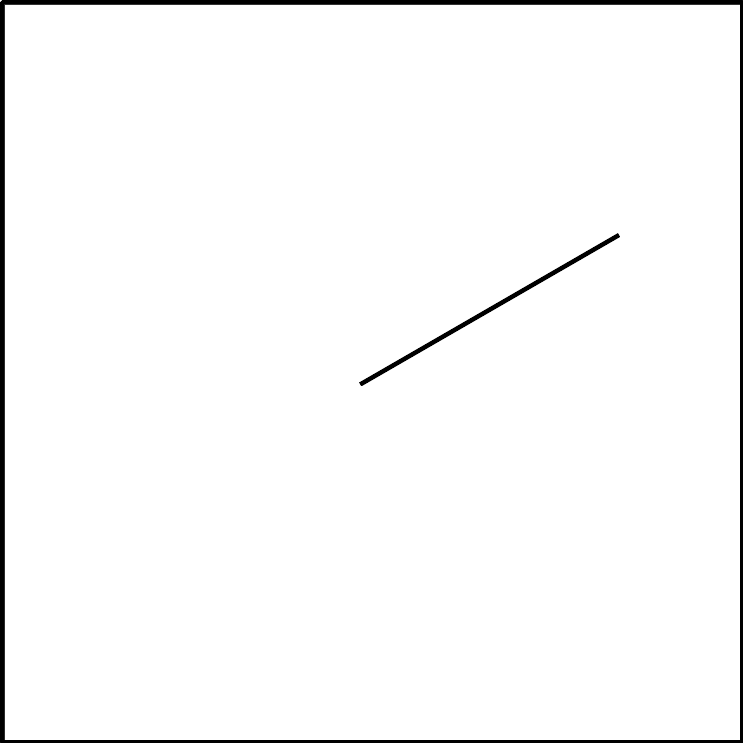
What do you notice? What do you wonder?

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|  |  |  |  |
|  | 0 | -1 |  |
|  | 0.5 | -0.87 |  |
|  | 0.87 | -0.5 |  |
| 0 | 1 | 0 |  |
|  | 0.87 | 0.5 |  |
|  | 0.5 | 0.87 |  |
|  | 0 | 1 |  |

### 2 A Tangent Ratio

#### Student Task Statement

1. Complete the table. For each positive angle in the table, add the corresponding point and the segment between it and the origin to the unit circle.

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| --- | --- | --- | --- |
|  |  |  |  |
|  | * 0 | * -1 |  |
|  | * 0.5 | * -0.87 |  |
|  | * 0.87 | * -0.5 |  |
| * 0 | * 1 | * 0 |  |
|  | * 0.87 | * 0.5 |  |
|  | * 0.5 | * 0.87 |  |
|  | * 0 | * 1 |  |
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1. How are the values of like the values of and ? How are they different?

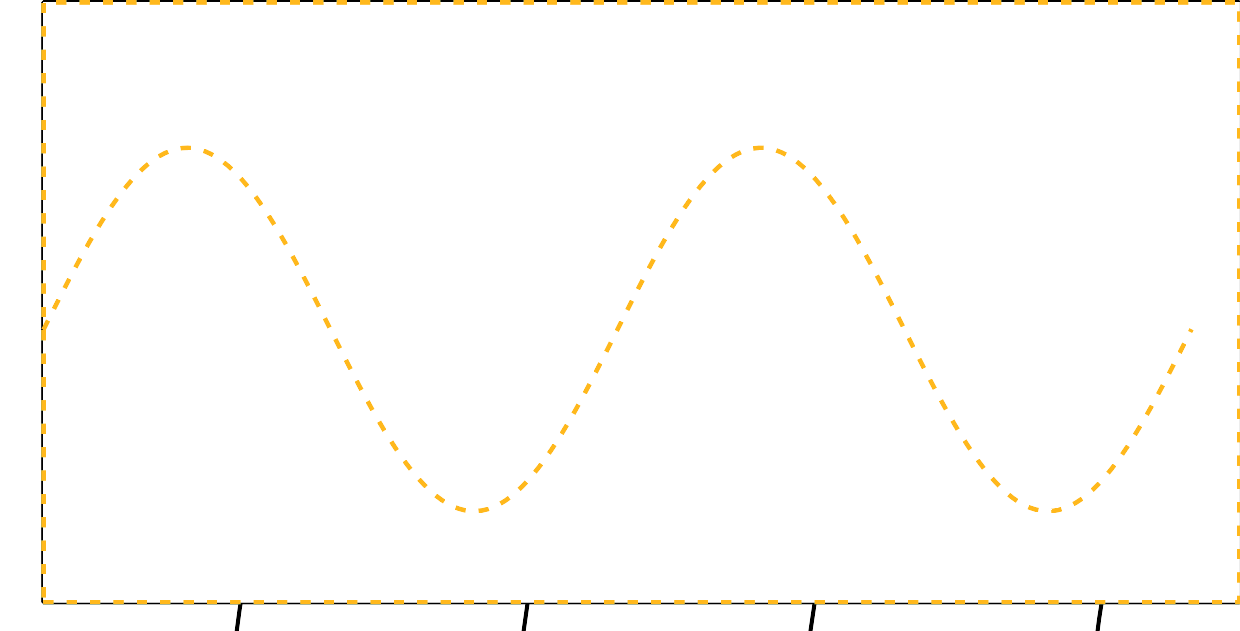
### 3 The Tangent Function

#### Student Task Statement

Before we graph , let’s figure out some things that must be true.

1. Explain why the graph of  has a vertical asymptote at .
2. Does the graph of have other vertical asymptotes? Explain how you know.
3. For which values of is zero? For which values of is one? Explain how you know.
4. Is the graph of periodic? Explain how you know.

#### Images for Activity Synthesis





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