Reciprocal Trigonometric Functions and their Graphs

LEARNING GOAL

🞏 I can sketch reciprocal trigonometric function using the reciprocal primary function.

**Part 1:**

1. Describe the graphical feature for the three primary trig. functions by indicating:
   1. Where the function increases, ↑, or decreases, ↓, within the interval indicated
   2. The value of  at each of the quadratal angles,.

* **is done for you. To graph the reciprocal we reciprocate the answer. That is if is increasing from to , then is decreasing in that same interval. If then which is undefined. That is a vertical asymptote exists at for**

1. Since the reciprocal functions are reciprocals of their perspective primary function, fill in the table by taking the reciprocal of each answer found in part 1.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |
|  | **-1** |  |  | **-1** |  |  |
|  | ↑ |  |  | ↓ |  |  |
| 0 | **0** |  |  | **undefined** |  |  |
|  | ↑ |  |  | ↓ |  |  |
|  | **1** |  |  | **1** |  |  |
|  | ↓ |  |  | ↑, |  |  |
|  | **0** |  |  | **undefined** |  |  |
|  | ↓ |  |  | ↑ |  |  |
|  | **-1** |  |  | **-1** |  |  |
|  | ↑ |  |  | ↓ |  |  |
|  | **0** |  |  | **undefined** |  |  |

1. Sketch **each** primary function and its reciprocal on the same grid in the domain by using the information obtained from the table above. Draw the vertical asymptotes (if they exist) and the coordinates of the minimum and maximum values, then sketch the curve using the intervals where the curve is increasing ↑ and decreasing ↓.

**Period:**

The horizontal distance required for the graph of a periodic function to complete one cycle.

**Amplitude** is the height from the mean, or rest, value of the **function** to its maximum or minimum.

**Part 2:**

1. Summarize the properties of the trigonometric functions below using the information you obtained from your graphs and the chart above.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Function** | **Range** | **Amplitude** | **Period (exact radian Measure)** | **Asymptotes** | **Asymptotes** |
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To watch an interactive applet demonstrating the graphs of the reciprocal functions go to:

<http://www.intmath.com/trigonometric-graphs/4-graphs-tangent-cotangent-secant-cosecant.php>