**7.2 Graphing Sine and Cosine – Phase Shift Notes**

When a horizontal shift is performed on a trigonometric function it is called a **phase shift**.

The general equations are *f* *x**a* sin [*b**x* *h*]*k* or *f* *x**a* cos [*b* *x* *h*] *k* , where *h* is the number of units the graph is shifted horizontally.

Identify the amplitude, period, phase shift, and vertical shift, then sketch one period of the graph.

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| --- | --- |
| Amplitude:  Period:  Phase Shift:  Vertical Shift: | Amplitude:  Period:  Phase Shift:  Vertical Shift: |
| Amplitude:  Period:  Phase Shift:  Vertical Shift: | In Salt Lake City, Utah, at the spring equinox (March 20, 2013) there were 12 hours and 9  minutes of daylight. The longest day (June 20, 2013) and shortest day (December 21, 2013) of  the year vary from the equinox by approximately 3 hours. Write a sine function that relates the  number of days to the variation of daylight hours in Salt Lake City. |
| The Ferris wheel at Lagoon has a diameter of 21.8 meters. It rotates on a platform that is 3  meters above the ground. The Ferris wheel completes one revolution in 40 seconds. Write an  equation to model the situation. |  |

**7.3 Graphing Tangent, Symmetry and Periodicity (Honors)**

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| Tangent      Period:  , is the interval length needed to complete one cycle.  Frequency:  , is the number of complete cycles a periodic function makes in a specific interval.  Asymptotes: |

Identify the period, vertical asymptotes, and *y*-intercept, then sketch one period of the graph.

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| Period:  Asymptotes:  Y-int: | Period:  Asymptotes:  Y-int: |

**Odd and Even Symmetry**

Symmetry in a unit circle shows that for any real number  , the points  and  where  and  , located on the terminal side of an angle  will have the same cosine values and opposite sine values. This hold true regardless of which quadrant contains the terminal side of the angle.

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Therefore,  making cosine an even function and  making sine an odd function.

Using symmetry, find exact values of  and 

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**Periodicity**

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