**Chapter 4.1 Graphing Trigonometric Functions**

Fill out the table with exact values.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| x (Deg) | 0 | 30 | 45 | 60 | 90 | 120 | 135 | 150 | 180 | 210 | 225 | 240 | 270 | 300 | 315 | 330 | 360 |
| x (Rad) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| sin(x) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| cos(x) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Graph the sin(x) over the interval [0, 2π]. Then use the fact that sine is odd to graph it over [-2π, 0].

**f(x) = sin(x)**

Graph the cos(x) over the interval [0, 2π]. Then use the fact that cosine is even to graph it over [-2π, 0].

**f(x) = cos(x)**

What do you notice about the graphs of sine and cosine?

**Sinusoidal Axis** – The horizontal line on which the graph “hangs”. For f(x) = sin(x) and g(x) = cos(x), the sinusoidal axis is y = 0. Just like in algebra, f(x) + D shifts the graph vertically D units.

Graph the following:

f(x) = sin(x) + 3 g(x) = cos(x) + 7

f(x) = sin(x) -4 g(x) = cos(x) -5

Each of the following was of the form f(x) = sin(x) + D and g(x) = cos(x) + D. In general how do you find the sinusoidal axis from the equation?

Graphs of sine and cosine rise to a maximum then descend to a minimum.

**Amplitude** – The maximum distance the graph gets from the sinusoidal axis.

(not the distance between the maximum and minimum).

Just like in Algebra, -f(x) flips f(x) over the x axis.

Graph the following. Pay attention to the amplitude and if the graph heads uphill or downhill from (0,0).

y = 3sin(x) y = 4cos(x)

y = -2sin(x) y = -2cos(x) - 3

y = 4sin(x) + 3 y = -5cos(x) + 1

Each of the functions was of the form y = Asin(x) + D and y = Acos(x) + D. What does the value of A tell you about the graph?

How can you find the y-value of the maximum and minimum of the graph in terms of A and D?

**Period** – The subset of the domain in which the range cycles before it repeats. Sine and cosine have a period of what?

*Graphing sin(x) and cos(x) Practice*

**1) y = 3sin(x) – 2**

A = \_\_\_\_\_\_\_\_\_\_\_\_

B = \_\_\_\_\_\_\_\_\_\_\_\_

Period = \_\_\_\_\_\_\_\_

S.A.: y = \_\_\_\_\_\_\_\_

Domain: \_\_\_\_\_\_\_

Range : \_\_\_\_\_\_\_\_

**2) f(x)= 2cos(x) + 1**

A = \_\_\_\_\_\_\_\_\_\_\_\_

B = \_\_\_\_\_\_\_\_\_\_\_\_

Period = \_\_\_\_\_\_\_\_

S.A.: y = \_\_\_\_\_\_\_\_

Domain: \_\_\_\_\_\_\_

Range : \_\_\_\_\_\_\_\_

**3) y = -2sin(x) + 4**

A = \_\_\_\_\_\_\_\_\_\_\_\_

B = \_\_\_\_\_\_\_\_\_\_\_\_

Period = \_\_\_\_\_\_\_\_

S.A.: y = \_\_\_\_\_\_\_\_

Domain: \_\_\_\_\_\_\_

Range : \_\_\_\_\_\_\_\_

**4) g(x) = cos(x) + 4**

A = \_\_\_\_\_\_\_\_\_\_\_\_

B = \_\_\_\_\_\_\_\_\_\_\_\_

Period = \_\_\_\_\_\_\_\_

S.A.: y = \_\_\_\_\_\_\_\_

Domain: \_\_\_\_\_\_\_

Range : \_\_\_\_\_\_\_\_

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**5) y = -3cos(x) - 4**

A = \_\_\_\_\_\_\_\_\_\_\_\_

B = \_\_\_\_\_\_\_\_\_\_\_\_

Period = \_\_\_\_\_\_\_\_

S.A.: y = \_\_\_\_\_\_\_\_

Domain: \_\_\_\_\_\_\_

Range : \_\_\_\_\_\_\_\_

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**6) y = 3sin(x) + 1**

A = \_\_\_\_\_\_\_\_\_\_\_\_

B = \_\_\_\_\_\_\_\_\_\_\_\_

Period = \_\_\_\_\_\_\_\_

S.A.: y = \_\_\_\_\_\_\_\_

Domain: \_\_\_\_\_\_\_

Range : \_\_\_\_\_\_\_\_

HW: 7)y=4sin(x)-2 8)y=-2cos(x) 9)y=(1/2)sin(x) 10)y = -2sin(x) – 4 11)y=6cos(x)-1