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Quiz 8 Solutions
MAC 1147.3079, Fall 2015
Thursday, November 12, 2015

Show all relevant work to support your answer. A correct answer without supporting work will not earn the points. **Problems 3 and 4 are on the back.**

1. (1 point) What's your most memorable college moment so far? (Hint: There is no wrong answer)

1. <u>**graduating**</u>

2. (4 points) Evaluate the following trigonometric functions:

(a) $\cos(3\pi)$

> **Solution:** Since the cosine graph has period 2π, we see
> $$\cos(3\pi) = \cos(3\pi - 2\pi) = \cos(\pi) = -1.$$

(b) $\sin(-405°)$

> **Solution:** Since sine has period $360°$, and by also using the fact that the reference angle of $315°$ is $360° - 315° = 45°$, we see
>
> $$\sin(-405°) = \sin(-405° + 360° + 360°) = \sin(315°) = -\sin(45°) = -\frac{\sqrt{2}}{2}.$$
>
> Note sine is negative in quadrant 4, and hence we add a minus in front of $\sin 45°$.

3. (2 points) You are skiing down a mountain with a vertical height of 1500 ft. The distance from the top of the mountain to the base is 3000 ft. What is the angle of elevation from the base to the top of the mountain? (Hint: Draw a picture)

Solution:
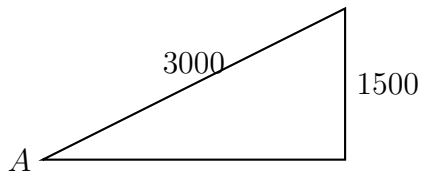
Looking at the triangle above, we want to find the measure of the angle corresponding with A, which we will denote θ. Since we have the lengths of the hypotenuse of the triangle and opposite side of θ, we see $\sin \theta = \frac{1500}{3000}$, or $\sin \theta = \frac{1}{2}$. Thus, $\theta = 30°$ or $\frac{\pi}{6}$.

4. (3 points) Find a and d for the function $f(x) = a \cos x + d$ such that the graph of f matches the figure below:
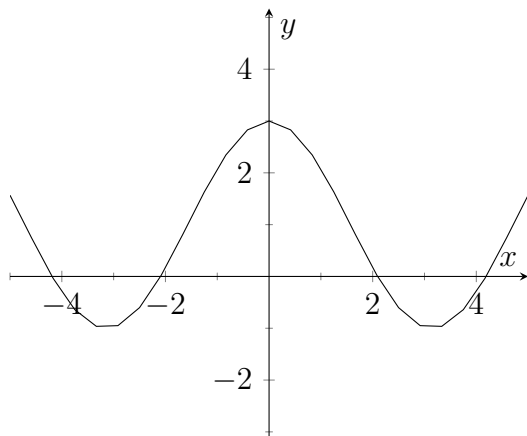
Solution: First, note the middle of the graph occurs along the line $y = 1$. So the amplitude of this cosine function is 2, and hence $a = 2$. Also, there is a vertical translation up one unit, which means $d = 1$.