

Group: _____ Present: _____

1. Find the angle of inclination θ_1 of $y = -3x + 4$

$$\theta_1 = \underline{\hspace{2cm}}$$

Find the angle of inclination θ_2 of $y = \frac{1}{2}x + 2$

$$\theta_2 = \underline{\hspace{2cm}}$$

Thus the angle between these two lines is _____

2. Two planes are flying at 35,000 feet. A pilot on one of the planes, which is flying North at 600 miles per hour, notices that the second plane is 50 miles away at a bearing of 40° , flying West at 550 miles per hour. How long does it take each plane to reach the crossing point? (Is this a “close call”?)

3. Given a spring which oscillates through a total distance of ten inches, with each oscillation taking two seconds, and which starts fully compressed, find a sinusoid which describes the position of the spring t seconds after it's release.

$$\text{Amplitude} = \underline{\hspace{2cm}} \quad \text{Period} = \underline{\hspace{2cm}}$$

$$\text{So } b = \omega = \underline{\hspace{2cm}}$$

$$\text{Phase shift} = \underline{\hspace{2cm}} \quad \text{So } c = \underline{\hspace{2cm}}$$

$$\text{Hence } f(t) = a \sin(\omega t + c) = \underline{\hspace{1cm}} \sin(\underline{\hspace{1cm}} t \underline{\hspace{1cm}})$$

(We are assuming height zero represents the middle height of an oscillation.)

4. Find a sinusoid which describes your height above the ground when riding a ferris wheel of diameter 60 feet, that reaches a maximum height of 65 feet, and which takes 10 seconds per revolution.

(You start your ride at the bottom!)

Amplitude = _____ Period = _____

So $b = \omega =$ _____

Phase shift = _____ So c _____

Vertical shift = _____

Hence $f(t) =$ _____

What is your height after four seconds? _____

When do you reach 60 feet in height? (Solve an equation):