MATH 119: Quiz 3

Name: key

Directions:

- Show your thought process (commonly said as "show your work") when solving each problem for full credit.
- If you do not know how to solve a problem, try your best and/or explain in English what you would do.
- Good luck!

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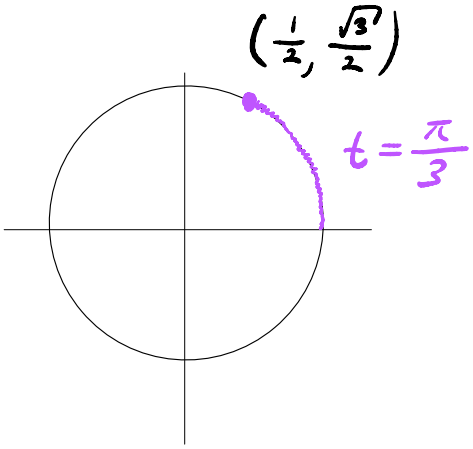
1. Find the following:

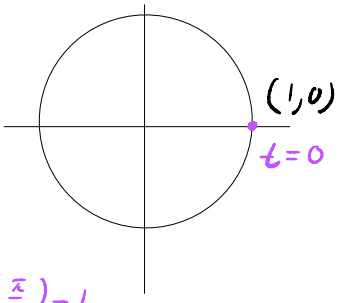
(a) $\sin^{-1}\left(\frac{\sqrt{3}}{2}\right) = \boxed{\frac{\pi}{3}}$

because $\sin\left(\frac{\pi}{3}\right) = \frac{\sqrt{3}}{2}$



(b) $\cos^{-1}(1) = \boxed{0}$

because $\cos(0) = 1$

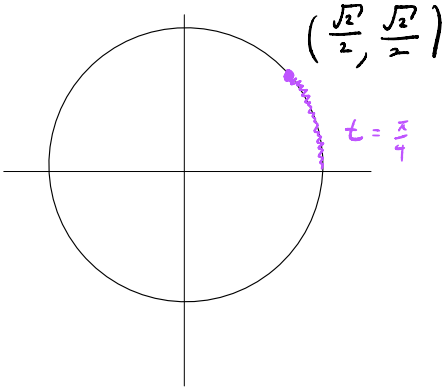


(c) $\sin\left(-\tan^{-1}(1)\right)$

since $\tan\left(\frac{\pi}{4}\right) = 1$

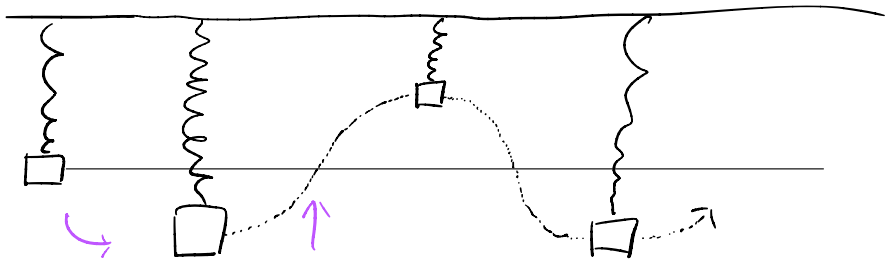
$= \sin\left(-\frac{\pi}{4}\right)$

$= \boxed{-\frac{\sqrt{2}}{2}}$



2. A mass suspended from a spring is at rest. It is pulled down 2 centimeters and released at time $t = 0$. It returns to the lowest position (one cycle) after 6 seconds.

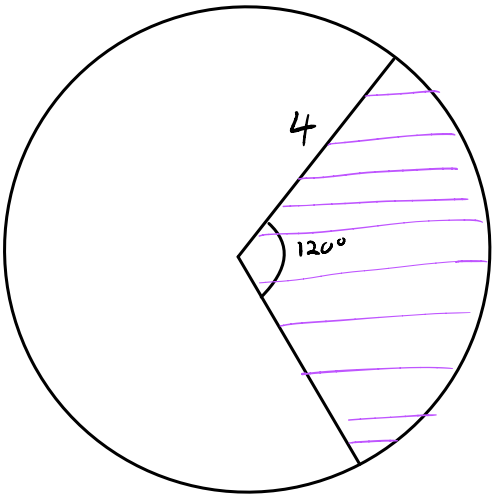
   Find an equation that describes its displacement.



Model: $a\cos(\omega t)$ $|a| = 2$, $\frac{2\pi}{\omega} = 6$ so $\omega = \frac{\pi}{3}$

So $\boxed{-2\cos\left(\frac{\pi}{3}t\right)}$

3. Suppose a circle of radius 4 cm has a central angle of 120° subtends an arc. What is the area of the sector?



careful! θ must be in radians. The definition requires it.

$$A = \frac{1}{2} r^2 \theta$$

$$= \frac{1}{2} \cdot (4\text{cm})^2 \cdot 120^\circ \cdot \frac{\pi \text{ rad}}{180^\circ}$$

$$= 8 \cdot \frac{2}{3}\pi \text{ cm}^2$$

$$= \boxed{\frac{16\pi}{3} \text{ cm}^2}$$