# Assignment #16

3/16/2001

## 20.3

**#1** c) what angle gives $\sin\theta = -1$ ? angle $= -\pi/2$

d) $\cos^{-1}(-1) = \pi$

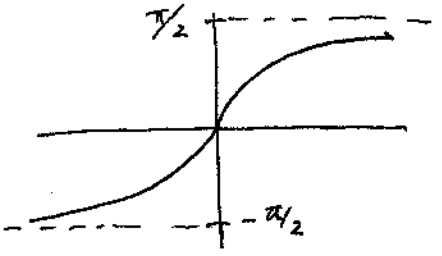
e) $\sin^{-1}(-0.5) = -\pi/6$

f) $\cos^{-1}(-0.5) = \frac{2\pi}{3}$

**#2** a) $\sin^{-1}(0.8) \approx 0.95$

- Go up a vertical distance $= 0.8$
- see how many radians get to that height $(0.85 \text{ rad})$

**#3** a)



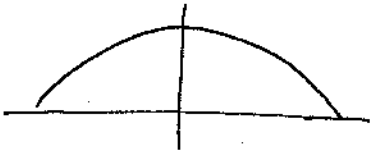

the derivative is positive through the entire domain

b) graphically, we see that

$-f(x) = f(-x)$. so $\tan^{-1}(x)$ is odd

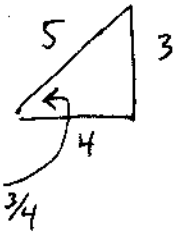
c) as you move from left to right, the derivative starts @ zero, reaches a maximum, and decreases to zero.

sketch of derivative function:

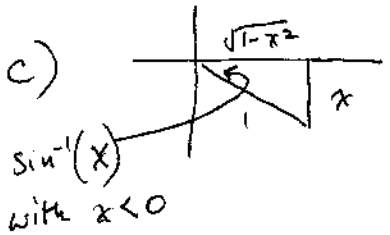


since $f(x) = f(-x)$, derivative is <u>even</u> function.

**#7** a)




so, $\sin(\arctan\frac{3}{4}) = \frac{\text{OPP}}{\text{HYP}} = \boxed{\frac{3}{5}}$

c) 


$\cos(\sin^{-1}x) = \frac{\sqrt{1-x^2}}{1} = \boxed{\sqrt{1-x^2}}$

## 20.4

(#1) b) $2\sin^2 x - \sin x - 1 = 0$

let $a = \sin x$

$2a^2 - a - 1 = 0$

$(2a+1)(a-1) = 0$

$2a+1=0$ or $a-1=0$

$a = -\frac{1}{2}$ or $a = 1$

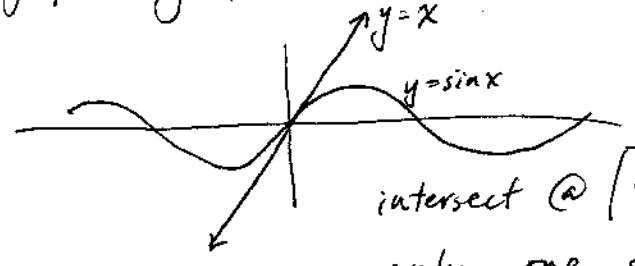
$\sin x = -\frac{1}{2}$ or $\sin x = 1$

$x = \left\{\frac{7\pi}{6}, \frac{11\pi}{6}, \frac{\pi}{2}\right\}$

(#14a) $\sin x - x = 0$

$\sin x = x$

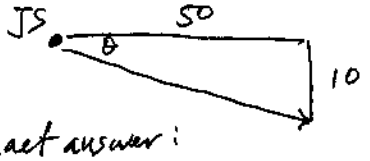
graphically find intersection of $y = \sin x$ and $y = x$




intersect @ $\boxed{x=0}$

only one solution

(#21)




exact answer:

$\theta = \tan^{-1}\left(\frac{10}{50}\right)$ approximation $\approx \boxed{11.3°}$