## 2.6 Trigonometry: a Refresher

EVALUATE EACH OF THE FOLLOWING EXPRESSIONS. DO NOT USE A CALCULATOR.

413.	$\tan \frac{\pi}{4}$	418.	$\sin^2\frac{5\pi}{6} + \tan^2\frac{\pi}{6}$	423.	$\sin(\arctan 1)$
414.	$(\sin\frac{3\pi}{4})(\cos\frac{5\pi}{4})$	419.	$\arcsin \frac{1}{2}$	424.	$\tan(\sec^{-1}2)$
415.	$\sec \frac{4\pi}{3}$	420.	$\arctan \frac{1}{\sqrt{3}}$	425.	$\sin(\arcsin 0.3)$
416.	$\cos(-\frac{\pi}{4})$	421.	$\sin^{-1}(-\frac{\sqrt{3}}{2})$	426.	$\arcsin(\sin \pi)$
417.	$\sin(\frac{\pi}{2} - \frac{\pi}{6})$	422.	$\tan^{-1}(-\sqrt{3})$	427.	$\arccos\left(\cos\left(-\frac{\pi}{4}\right)\right)$

**428.** Which of the following are undefined?

a)  $\arccos x$ 

a)  $\operatorname{arccos} 1.5$  b)  $\operatorname{arcsec} 1.5$  c)  $\operatorname{arctan} 1.5$  d)  $\operatorname{arcsec} 0.3$  e)  $\operatorname{arcsin} 2.4$ 

EVALUATE THE FOLLOWING LIMITS. GRAPH THE FUNCTIONS ON YOUR CALCULATOR IF NEC-ESSARY.

**429.**  $\lim_{x \to 1^+} \sin^{-1} x$  **431.**  $\lim_{x \to 1} \csc^{-1} x$  **433.**  $\lim_{x \to -\infty} \arctan x$ 
**430.**  $\lim_{x \to 1} \sec^{-1} x$  **432.**  $\lim_{x \to \infty} \arctan x$  **434.**  $\lim_{x \to \infty} \arccos x$ 

**435.** We know  $\sin x$  is an odd function and  $\cos x$  is an even function, but what about these?

c)  $\arctan x$ 

d)  $\sec x$ 

Find exact solutions to each of the following equations over the interval  $[0, 2\pi)$ .

436.	$\cos 3\theta - 1 = 0$	439.	$2\sin^2\theta - 3\sin\theta + 1 = 0$
437.	$\tan 2x + 1 = 0$	440.	$2\cos^2\theta + \cos\theta = 0$
438.	$\sin 3\theta + \frac{\sqrt{2}}{2} = 0$	441.	$\cos x + 2 \sec x = -3$

b)  $\arcsin x$ 

**442.** Water is draining from a tank. The volume of water in the tank is given by  $V(t) = 1000 + (20 - t)^3$ , where V is in gallons and t is the number of hours since the water began draining. Answer the following questions using correct units.

- a) How much water is in the tank initially?
- b) How fast is it draining after 10 hours?
- c) Will the tank have been completely drained after two days? Why?

e)  $\csc x$ 

Any fool can know. The point is to understand.  $-Albert \ Einstein$