Precalculus Name_____ ID: 1

Assignment3 Date_____ Period____

Find the exact value of each expression in radians and degrees

1) $\sin^{-1}\left(-\frac{\sqrt{2}}{2}\right)$ $\boxed{-45^\circ \text{ OR } -\frac{\pi}{4}}$

2) $\csc^{-1}\left(-\frac{2\sqrt{3}}{3}\right)$ ← reciprocal of $\frac{\sqrt{3}}{2}$

↓ sin

$\boxed{-60^\circ \text{ or } -\frac{\pi}{3}}$

3) $\csc^{-1}\sqrt{2}$ ← reciprocal of $\frac{\sqrt{2}}{2}$

reciprocal of sin

$\boxed{45^\circ \text{ or } \frac{\pi}{4}}$

4) $\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right)$ $\boxed{150^\circ \text{ or } \cancel{\frac{3\pi}{2}}\ \frac{5\pi}{6}}$

5) $\cos^{-1}\left(-\frac{\sqrt{2}}{2}\right)$

$\boxed{135^\circ \text{ or } \frac{3\pi}{4}}$

6) $\sin^{-1}\frac{\sqrt{3}}{2}$

$\boxed{60^\circ \text{ or } \frac{\pi}{3}}$

7) $\sin^{-1} 1$ $\boxed{90^\circ \text{ or } \cancel{\pi/2}}$

$\cancel{90^\circ \text{ or } \frac{\pi}{2}}$ 0°

8) $\cot^{-1}(-\sqrt{3})$ ← rec occurs at $\pm\left(\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$ $\boxed{150^\circ \text{ or } \frac{5\pi}{6}}$

reciprocal of tan

$\cancel{\boxed{-30^\circ \text{ or } -\frac{\pi}{6}}}$

9) $\csc^{-1} 2$ ← reciprocal $= \frac{1}{2}$

reciprocal of sin $\boxed{30^\circ \text{ or } \frac{\pi}{6}}$

10) $\csc^{-1}(-\sqrt{2})$

find $\sin^{-1}\left(-\frac{\sqrt{2}}{2}\right)$ $\boxed{-45^\circ \text{ or } -\frac{\pi}{4}}$

11) $\tan^{-1} 0$

occurs at (1,0) and (-1,0) but we must stay in Q1 and Q4 ∴ $\boxed{0^\circ}$

12) $\cot^{-1}\sqrt{3}$

look for $\left(\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$

$\boxed{30^\circ \text{ or } \frac{\pi}{6}}$

13) $\sin^{-1} 0$

$\cancel{\boxed{90^\circ \text{ or } \frac{\pi}{2}}}$ $\boxed{0^\circ}$

14) $\csc^{-1}(-2)$

$\sin^{-1}\left(-\frac{1}{2}\right)$ $\boxed{-30^\circ \text{ or } -\frac{\pi}{6}}$

15) $\csc^{-1}\frac{1}{1}$

same as $\sin^{-1} 1$

$\boxed{90^\circ \text{ or } \frac{\pi}{2}}$

16) $\sin^{-1}\frac{1}{2}$

$\boxed{30^\circ \text{ or } \frac{\pi}{6}}$

17) $\sin^{-1}\frac{\sqrt{2}}{2}$ $\boxed{45^\circ \text{ or } \frac{\pi}{4}}$

18) $\cos^{-1}\frac{\sqrt{2}}{2}$ $\boxed{45^\circ \text{ or } \frac{\pi}{4}}$

19) $\tan^{-1}\sqrt{3}$

occurs at $\left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$

$\boxed{60^\circ \text{ or } \frac{\pi}{3}}$

20) $\sec^{-1}(-2)$

same as $\cos^{-1}\left(-\frac{1}{2}\right)$

$\boxed{120^\circ \text{ or } \frac{2\pi}{3}}$

Find the exact value of each expression.

21) $\tan\left(\cos^{-1}\frac{\sqrt{3}}{2}\right)$

$\tan 30^\circ = \boxed{\frac{\sqrt{3}}{3}}$

22) $\cos^{-1}\left(\cot\frac{\pi}{2}\right)$

$\cos^{-1}(0)$

$\boxed{90^\circ \text{ or } \frac{\pi}{2}}$

23) $\tan^{-1}(\sec 0)$

$\tan^{-1}(1)$

$\boxed{45^\circ \text{ or } \frac{\pi}{4}}$

24) $\cos^{-1}\left(\cos\frac{2\pi}{3}\right)$

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

25) $\tan^{-1}\left(\cos\frac{\pi}{2}\right)$

$\tan^{-1}(0)$

$\boxed{0}$

26) $\tan^{-1}\left(\cot\frac{\pi}{4}\right)$

$\tan^{-1}(1)$

$\boxed{45^\circ \text{ or } \frac{\pi}{4}}$

27) $\cos^{-1}\left(\tan\left(-\frac{\pi}{4}\right)\right)$

$\cos^{-1}(-1) = \boxed{180^\circ \text{ or } \pi}$

28) $\tan^{-1}\left(\cot\frac{\pi}{2}\right)$

$\tan^{-1} 0$

$\boxed{0}$

29) $\sin^{-1}\left(\tan\left(-\frac{\pi}{4}\right)\right)$

$\sin^{-1}(-1)$

$\boxed{-90^\circ \text{ or } -\frac{\pi}{2}}$

30) $\sin^{-1}(\cos 0)$

$\sin^{-1}(1)$

$\boxed{90^\circ \text{ or } \frac{\pi}{2}}$

31) $\sin^{-1}\left(\csc\left(-\frac{\pi}{2}\right)\right)$

$\sin^{-1}(-1)$

$\boxed{-90^\circ \text{ or } -\frac{\pi}{2}}$

32) $\sin^{-1}(\cos \pi)$

$\sin^{-1}(-1)$

$\boxed{-90^\circ \text{ or } -\frac{\pi}{2}}$