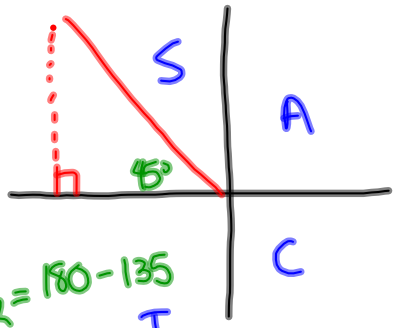
Questions from Homework

Solving Trigonometric Expressions

Without a calculator determine the value of...

$$\frac{2\cos 180^\circ + \sin 135^\circ}{\cos^2(-330)}$$

Sketch:



$\theta_R = 180 - 135$

$\theta_R = 45^\circ$

$$\frac{2\cos 180^\circ + \sin 135^\circ}{\cos^2 30^\circ}$$

$$\frac{2(-1) + \left(+\frac{\sqrt{2}}{2}\right)}{\left(\frac{\sqrt{3}}{2}\right)^2}$$

$$\frac{\boxed{\frac{-2}{1} + \frac{\sqrt{2}}{2}}}{\frac{3}{4}}$$

Adding Fractions

$$\left(\frac{-4}{2} + \frac{\sqrt{2}}{2}\right) \times \frac{4}{3}$$

$$\frac{(-4+\sqrt{2})}{\cancel{2}_{1}} \times \frac{\cancel{4}^{2}}{3}$$

$$\frac{-16+4\sqrt{2}}{6}$$

$$\boxed{\frac{-8+2\sqrt{2}}{3}} \text{ or } \boxed{\frac{2\sqrt{2}-8}{3}}$$

Solving Trigonometric Equations

$$\sin^2\theta - \frac{\sqrt{3}}{2}\sin\theta = 0, \quad -360° \le \theta \le 360°$$

$$\sin\theta\left(\sin\theta - \frac{\sqrt{3}}{2}\right) = 0$$

$\sin\theta = 0$

$\theta = 0°, 180°, 360°$

$\theta = -360°, -180°$

$\sin\theta - \frac{\sqrt{3}}{2} = 0$

$\sin\theta = \frac{\sqrt{3}}{2}$

$\theta_R = 60°$

Q1	Q2
$\theta = 60°$	$\theta = 180° - 60°$
$\theta = -300°$	$\theta = 120°$
	$\theta = -240°$

Factor

Solving Trigonometric Equations

$-5 \times 2 = -10$

$-5 + 2 = -3$

$$\sec^2\theta - 3\sec\theta - 10 = 0 \qquad 0 < \theta < 2\pi$$

$$(\sec\theta - 5)(\sec\theta + 2) = 0$$

$\sec\theta - 5 = 0$

$\sec\theta = 5$

$\cos\theta = \frac{1}{5}$

$\theta_R = \cos^{-1}(0.2)$

$\theta_R = 1.37$

$\sec\theta + 2 = 0$

$\sec\theta = -2$

$\cos\theta = -\frac{1}{2}$

$\theta_R = \frac{\pi}{3}$

where is $\cos\theta$ "+"

Q1	Q4
$\theta = \theta_R$	$\theta = 2\pi - 1.37$
$\boxed{\theta = 1.37}$	$\theta = 6.28 - 1.37$
	$\boxed{\theta = 4.91}$

where is $\cos\theta$ "−"

Q2	Q3
$\theta = \pi - \theta_R$	$\theta = \pi + \theta_R$
$\theta = \pi - \frac{\pi}{3}$	$\theta = \pi + \frac{\pi}{3}$

$$\boxed{\theta = \frac{2\pi}{3} \qquad \theta = \frac{4\pi}{3}}$$

Exact

$$\boxed{\theta = 1.37, \frac{2\pi}{3}, \frac{4\pi}{3}, 4.91}$$

Homework

Page 141-143 #1-7
Page 145-147 #1-9
Chapter 4 Review