# Questions from Homework

Ex 7.7

⑧ d) $1-\sin\theta = 2\sin^2\theta$

$2\times -1 = -2$
$2+-1 = 1$

$0 = 2\sin^2\theta + \sin\theta - 1$

$0 = (2\sin^2\theta + 2\sin\theta)(-\sin\theta - 1)$

$0 = 2\sin\theta(\sin\theta+1) - 1(\sin\theta+1)$

$0 = (2\sin\theta - 1)(\sin\theta+1)$

$2\sin\theta - 1 = 0$

$2\sin\theta = 1$

$\sin\theta = \frac{1}{2}$ ref $= 30°$

| Quad 1 | Quad 2 |
|---|---|
| $\theta = 30°$ | $\theta = 150°$ |
| $\theta = -330°$ | $\theta = -210°$ |

$\sin\theta + 1 = 0$

$\sin\theta = -1$

$\theta = 270°$

$\theta = -90°$

⑧ e) $2\sin^2\theta + 5\sin\theta - 3 = 0$

$-1\times 6 = -6$
$-1+6 = 5$

$(2\sin^2\theta - \sin\theta)(+6\sin\theta - 3) = 0$

$\sin\theta(2\sin\theta - 1) + 3(2\sin\theta - 1) = 0$

$(2\sin\theta - 1)(\sin\theta + 3) = 0$

$2\sin\theta - 1 = 0$

$2\sin\theta = 1$

$\sin\theta = \frac{1}{2}$ ref $= 30°$

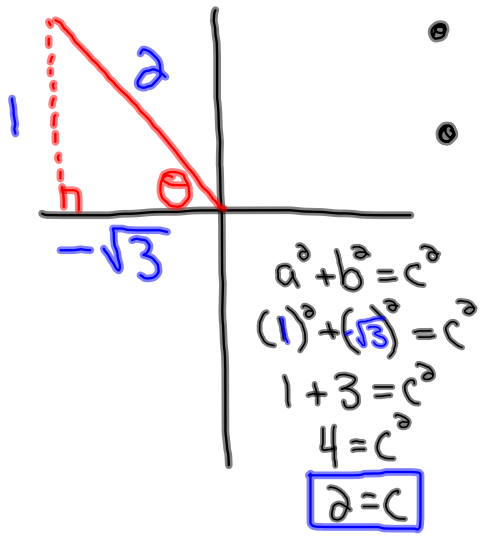
| Quad 1 | Quad 2 |
|---|---|
| $\theta = 30°$ | $\theta = 150°$ |
| $\theta = -330°$ | $\theta = -210°$ |

$\sin\theta + 3 = 0$

$\sin\theta = -3$

Not Possible

③




$a^2+b^2=c^2$

$(1)^2+(\sqrt{3})^2=c^2$

$1+3=c^2$

$4=c^2$

$\boxed{2=c}$

- $\theta$ is in 2nd Quad
- $\tan\theta = -\frac{1}{\sqrt{3}}$ $\frac{\text{opp}}{\text{adj}}$

$\sin\theta = \frac{1}{2}$ $\quad \csc\theta = 2$

$\cos\theta = -\frac{\sqrt{3}}{2}$ $\quad \sec\theta = -\frac{2}{\sqrt{3}} = -\frac{2\sqrt{3}}{3}$

$\tan\theta = -\frac{1}{\sqrt{3}} = -\frac{\sqrt{3}}{3}$ $\quad \cot\theta = -\sqrt{3}$

① c) $-323148$

① $-323148 \div 360 = -897.6\overline{3}$

② $-897.6\overline{3} - (-897) = -0.6\overline{3}$

③ $-0.6\overline{3} \times 360 = -228°$

* ④ $-228 + 360 = \boxed{132°}$ ← Principal Angle

⑥ b) $\cos^2\theta - \cos\theta = 0$ $\quad -360 \le \theta \le 360$

$\cos\theta(\cos\theta - 1) = 0$

$\cos\theta = 0$ | $\cos\theta - 1 = 0$

$\theta = 90°, 270°$ | $\cos\theta = 1$

$\theta = -270°, -90°$ | $\theta = 0°, 360°$

$\theta = -360$

d) $\tan\theta$ = undefined

$\theta = 90°, 270°$

$\theta = -270°, -90°$

g) $\sin^2\theta = \frac{1}{4}$

$\sin\theta = \pm\frac{1}{2}$

ref = 30°

| Q1 | Q2 | Q3 | Q4 |
|---|---|---|---|
| $\theta = 30°$ | $\theta = 150°$ | $\theta = 210°$ | $\theta = 330$ |
| $\theta = -330°$ | $\theta = -210°$ | $\theta = -150°$ | $\theta = -30$ |

⑥ a) $\frac{3}{1-2\sin 45°}$

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

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

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

$\boxed{-3-3\sqrt{2}}$

b) $\frac{4}{\sin 90° + 2\cos 30°}$

$\frac{4}{(1)+2\left(\frac{\sqrt{3}}{2}\right)}$

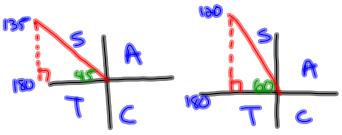
$\frac{4}{(1+\sqrt{3})}\frac{(1-\sqrt{3})}{(1-\sqrt{3})}$

$\frac{4-4\sqrt{3}}{1-3}$

$\frac{4-4\sqrt{3}}{-2}$

$\boxed{-2+2\sqrt{3}}$ or $\boxed{2\sqrt{3}-2}$

c) $\frac{\sin^2 135°}{8\sin 120° + 5}$







$\frac{\left(\frac{1}{\sqrt{2}}\right)^2}{4\left(8\left(\frac{\sqrt{3}}{2}\right)+5\right)}$

$\frac{\frac{1}{2}}{4\sqrt{3}+5}$

$\frac{1}{2} \times \frac{1}{4\sqrt{3}+5}$

$\frac{1}{(8\sqrt{3}+10)}\frac{(8\sqrt{3}-10)}{(8\sqrt{3}-10)}$

$\frac{8\sqrt{3}-10}{192-100}$

$\frac{8\sqrt{3}-10}{92} \rightarrow \boxed{\frac{4\sqrt{3}-5}{46}}$ or $\boxed{\frac{2\sqrt{3}}{23}-\frac{5}{46}}$

Review #1

⑤ d) $\tan\theta = \text{undefined}$ $\quad -360^\circ \le \theta \le 360^\circ$

$\theta = 90^\circ, 270^\circ$

$\theta = -270^\circ, -90^\circ$

Review #2

⑤ d) $2\cos^2\theta + 7\cos\theta = -3$ $\quad -360 \le \theta \le 360$

$2\cos^2\theta + 7\cos\theta + 3 = 0$ $\quad 1 \times 6 = 6$, $1 + 6 = 7$

$(2\cos^2\theta + 1\cos\theta)(6\cos\theta + 3) = 0$

$\cos\theta(2\cos\theta + 1) + 3(2\cos\theta + 1) = 0$

$(2\cos\theta + 1)(\cos\theta + 3) = 0$

$2\cos\theta + 1 = 0$ | $\cos\theta + 3 = 0$ Not Possible

$\cos\theta = -\frac{1}{2}$ | $\cos\theta = -3$

ref = 60°

| Q2 | Q3 |
|---|---|
| $\theta = 180 - \text{ref}$ | $\theta = 180 + \text{ref}$ |
| $\theta = 120^\circ$ | $\theta = 240^\circ$ |
| $\theta = -240$ | $\theta = -120^\circ$ |

Review #3

⑥ a) $\frac{4}{1 - 3\cos 45^\circ}$

$\frac{4}{1 - 3\left(\frac{\sqrt{2}}{2}\right)}$

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

$\frac{4}{\frac{2}{2} - \frac{3\sqrt{2}}{2}}$

$4 \times \frac{2}{2 - 3\sqrt{2}}$

$\frac{8}{(2 - 3\sqrt{2})} \cdot \frac{(2 + 3\sqrt{2})}{(2 + 3\sqrt{2})}$

$\frac{16 + 24\sqrt{2}}{4 - 18}$

$\frac{16 + 24\sqrt{2}}{-14}$

$\frac{8 + 12\sqrt{2}}{-7}$ or $\frac{-8 - 12\sqrt{2}}{7}$

* $(3\sqrt{2})(3\sqrt{2})$

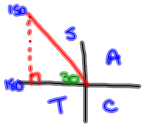
$9\sqrt{4}$

$9(2)$

$18$

e) $\cos^2(-210^\circ) + \sin^2(-30)\csc 30^\circ$

$\cos^2 150^\circ + \sin^2 330^\circ \csc 30^\circ$

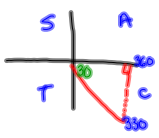



$\left(-\frac{\sqrt{3}}{2}\right)^2 + \left(-\frac{1}{2}\right)^2\left(\frac{2}{1}\right)$

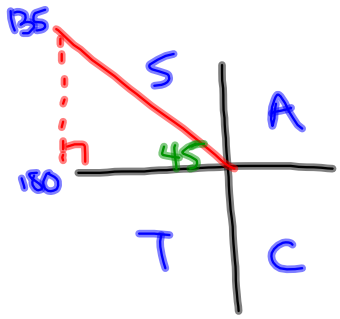
$\frac{3}{4} + \left(\frac{1}{4}\right)(2)$

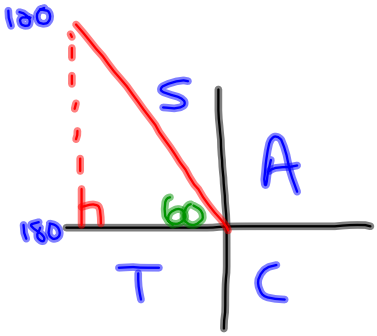
$\frac{3}{4} + \frac{2}{4}$

$\frac{5}{4}$



Review # 1




⑥ c) $\dfrac{\sin^2 135^\circ}{8\sin 120^\circ + 5}$

$\dfrac{\left(\frac{1}{\sqrt{2}}\right)^2}{4\left(\frac{4\sqrt{3}}{2}\right)+5}$

$\dfrac{\frac{1}{2}}{4\sqrt{3}+5}$

$\frac{1}{2} \times \frac{1}{4\sqrt{3}+5}$

$\dfrac{1}{(8\sqrt{3}+10)(8\sqrt{3}-10)}$ $(8\sqrt{3}-10)$

$8\sqrt{3} \cdot 8\sqrt{3}$

$64\sqrt{9}$

$64(3)$

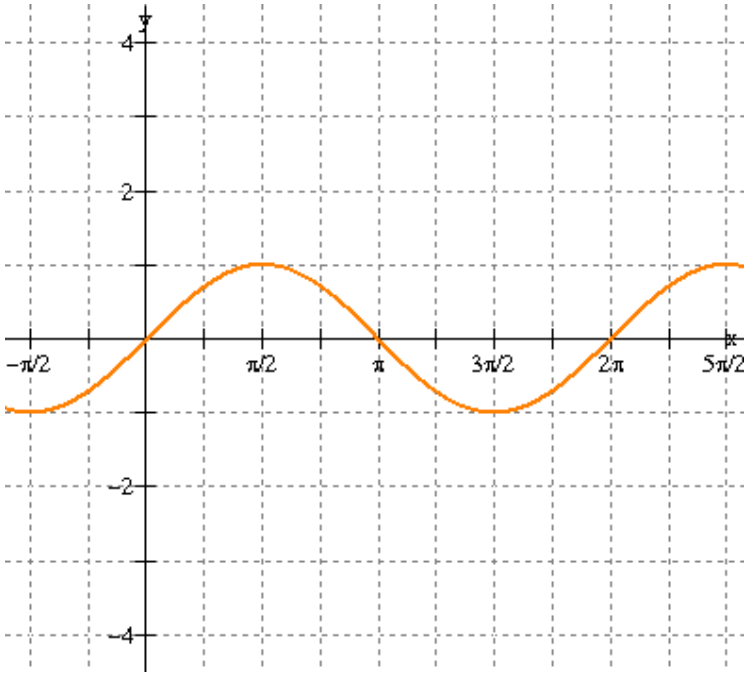
$192$

$\dfrac{8\sqrt{3}-10}{192-100}$

$\dfrac{8\sqrt{3}-10}{92} \rightarrow \boxed{\dfrac{4\sqrt{3}-5}{46}}$

# Graphs of Other Trig Functions

## y = sin θ



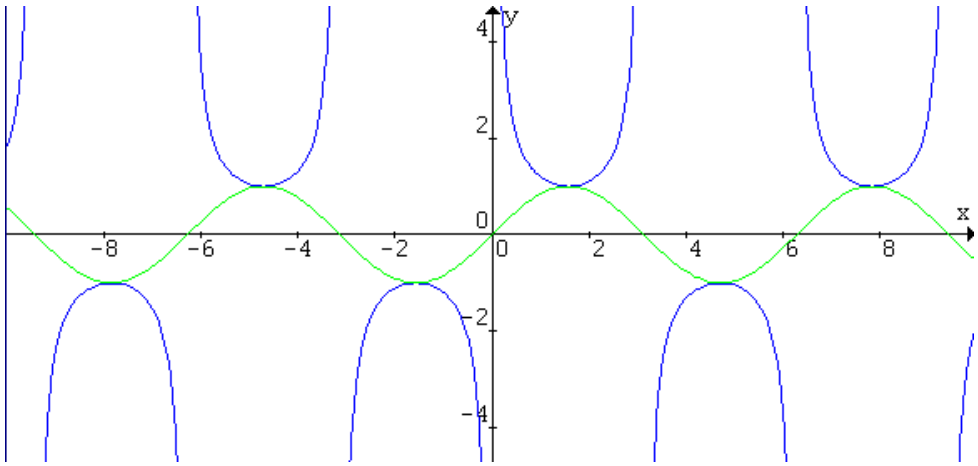

What would the graph of **csc θ** look like?

**REMEMBER:**

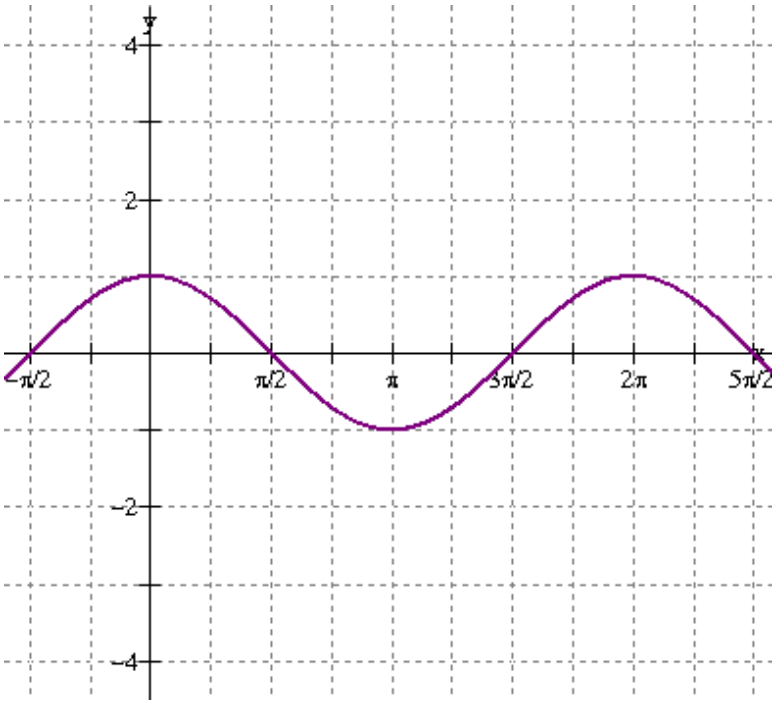
$$\csc\theta = \frac{1}{\sin\theta}$$

where sin x = 0,
csc x is undefined

y = sin x  y = csc x



# y = cos θ




What would the graph of **sec θ** look like?

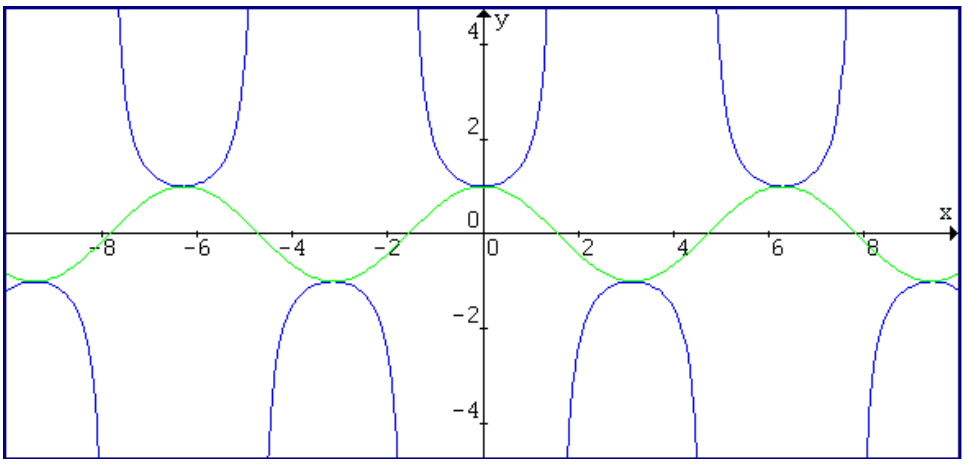
**REMEMBER:**

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

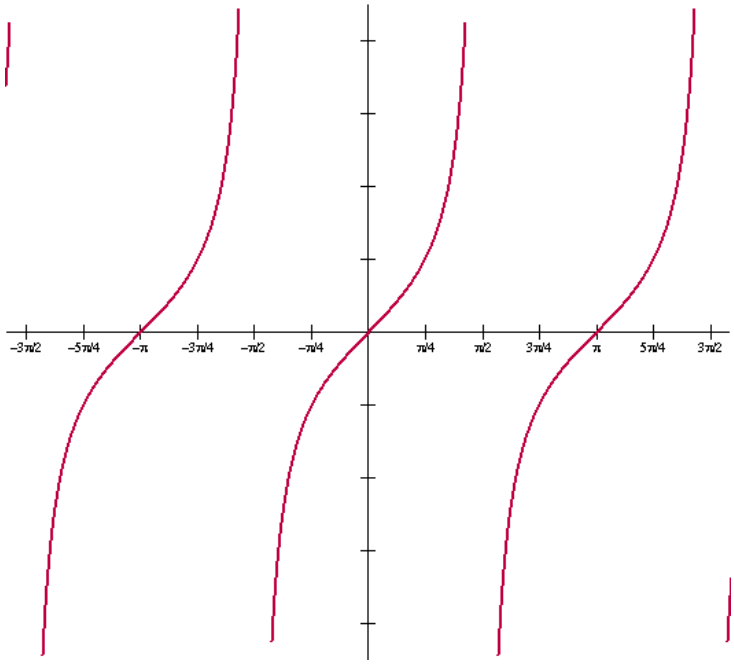
where cos x = 0,
sec x is undefined

y = cos x

y = sec x



# y = tan θ



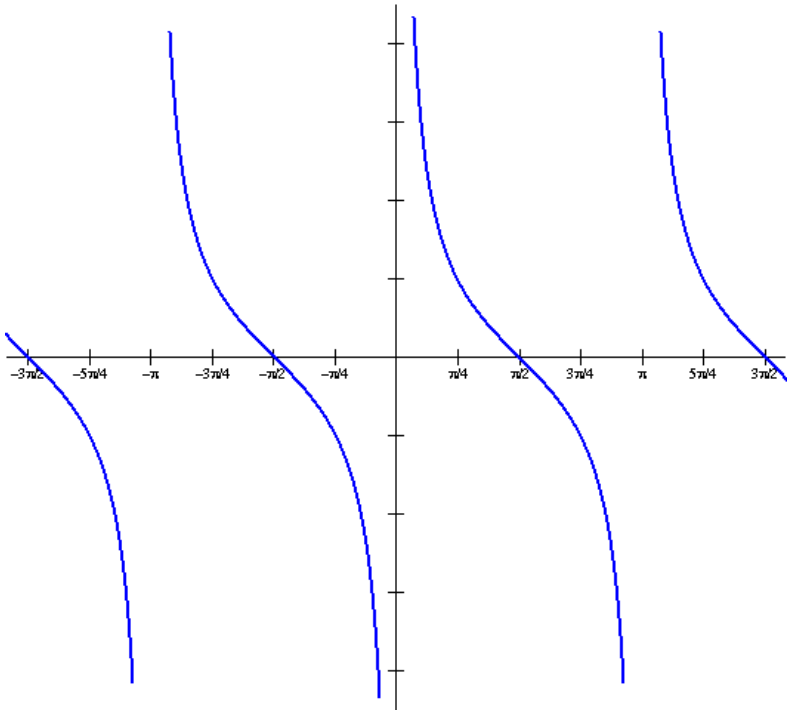

What would the graph of **cot θ** look like?

**REMEMBER:**

$$\tan x = \frac{1}{\cot x}$$

where tan x = 0,
cot x is undefined

# y = cot θ



# Homework