

7-5 Notes

The other trigonometric functions

Learning Targets:

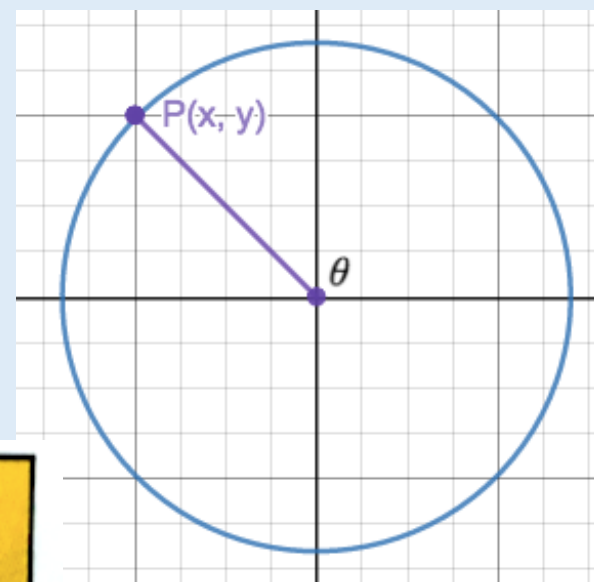
- I can graph all 6 trig functions
- I can find all 6 trig ratios given a diagram.
- I can find all 6 trig ratios given a right triangle.

Remember...

$$\csc \theta = \frac{r}{y}$$

$$\sec \theta = \frac{r}{x}$$

$$\cot \theta = \frac{x}{y}$$



	I	II	III	IV
$\sin \theta$ and $\csc \theta$	+	+	-	-
$\cos \theta$ and $\sec \theta$	+	-	-	+
$\tan \theta$ and $\cot \theta$	+	-	+	-

Example 1:

Use your calculator to approximate the value of each expression.

$$\text{a) } \cot 165^\circ = \frac{1}{\tan 165^\circ} \approx -3.732$$

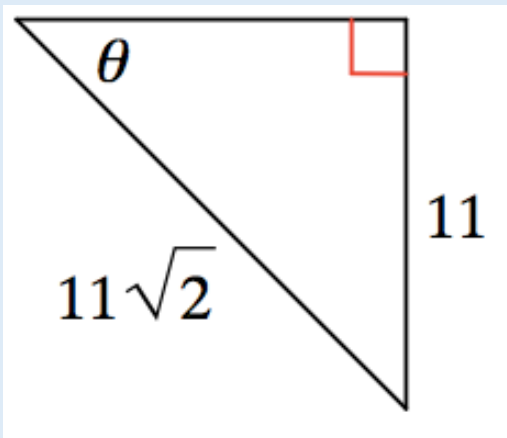
$$\text{b) } \csc 204^\circ = \frac{1}{\sin 204^\circ} \approx -2.459$$

$$\text{c) } \sec 73^\circ = \frac{1}{\cos 73^\circ} \approx 3.420$$



Example 2:

Use the triangle below to find $\sec \theta$.



Use Pythagorean Theorem to find the missing length.

$$x^2 + 11^2 = (11\sqrt{2})^2$$

$$x^2 + 121 = 121(2)$$

$$x^2 + 121 = 242$$

$$x^2 = 121$$

$$x = 11$$

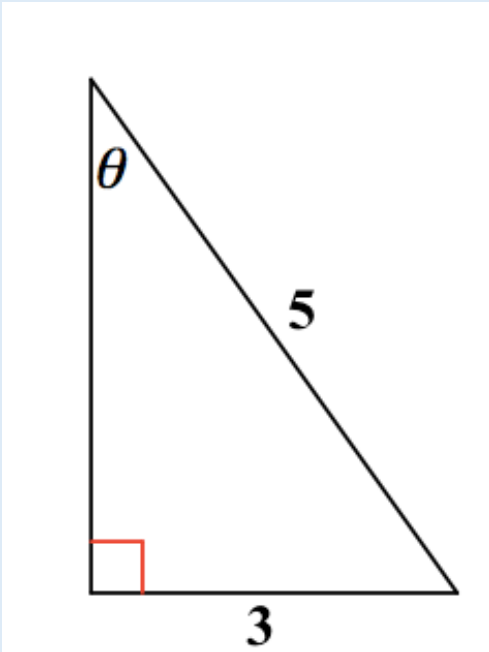
Now use SOH CAH TOA to find $\sec \theta$

$$\sec \theta = \frac{11\sqrt{2}}{11}$$

$$= \sqrt{2}$$

Example 3:

Find $\cot \theta$ if $\csc \theta = \frac{5}{3}$



Draw and label your own right triangle.

$$\csc \theta = \frac{5}{3} = \frac{\text{hyp}}{\text{opp}}$$

Use Pythagorean Theorem to find the missing side length.

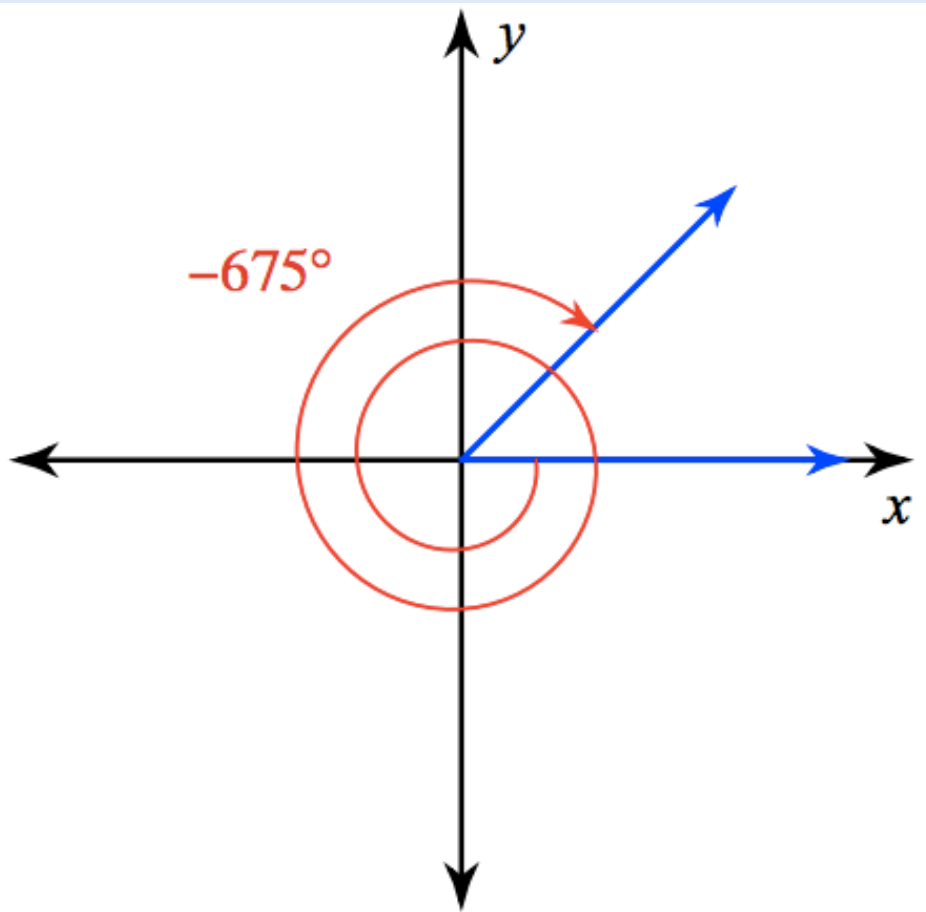
$$x^2 + 3^2 = 5^2$$

$$x = 4$$

Now use SOH CAH TOA to find $\cot \theta$

$$\cot \theta = \frac{4}{3}$$

Example 4:



Find $\csc -675^\circ$.

First, let's find the angle
coterminal to -675° .

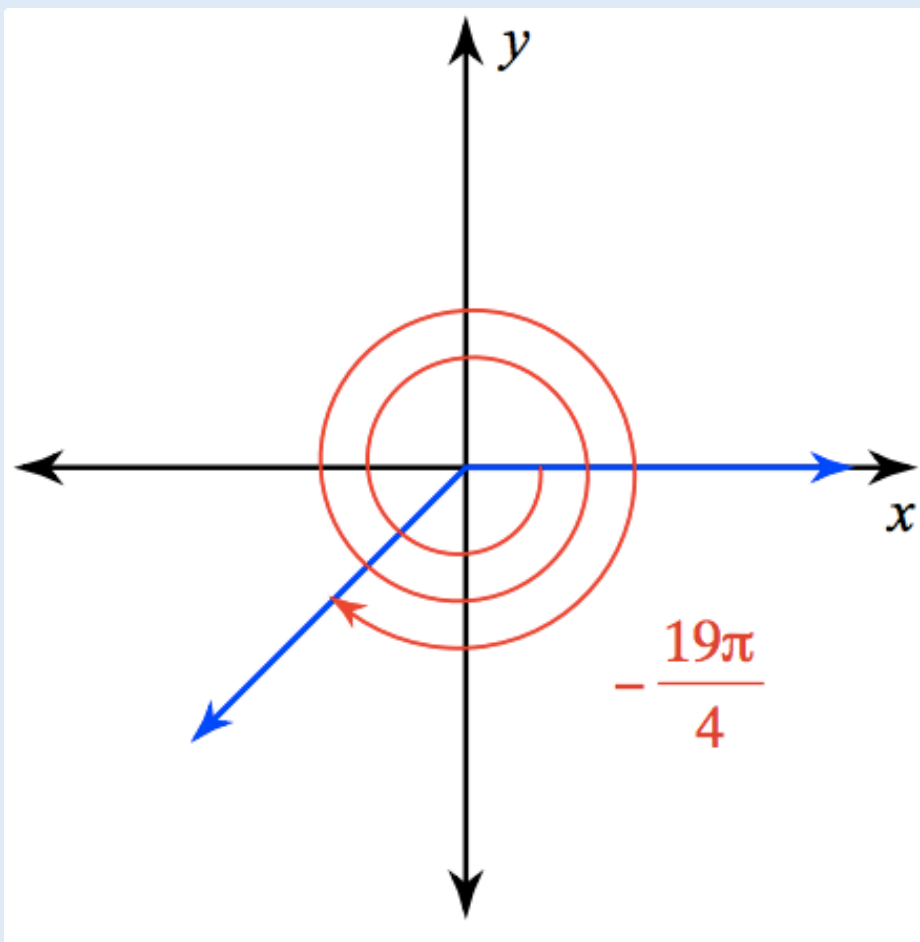
$$-675^\circ + 360^\circ = -315^\circ$$

$$-315^\circ + 360^\circ = 45^\circ$$

$$\csc -675^\circ = \csc 45^\circ$$

$$= \frac{2}{\sqrt{2}} = \frac{2\sqrt{2}}{2} = \sqrt{2}$$

Example 5:



Find $\sec -\frac{19\pi}{4}$

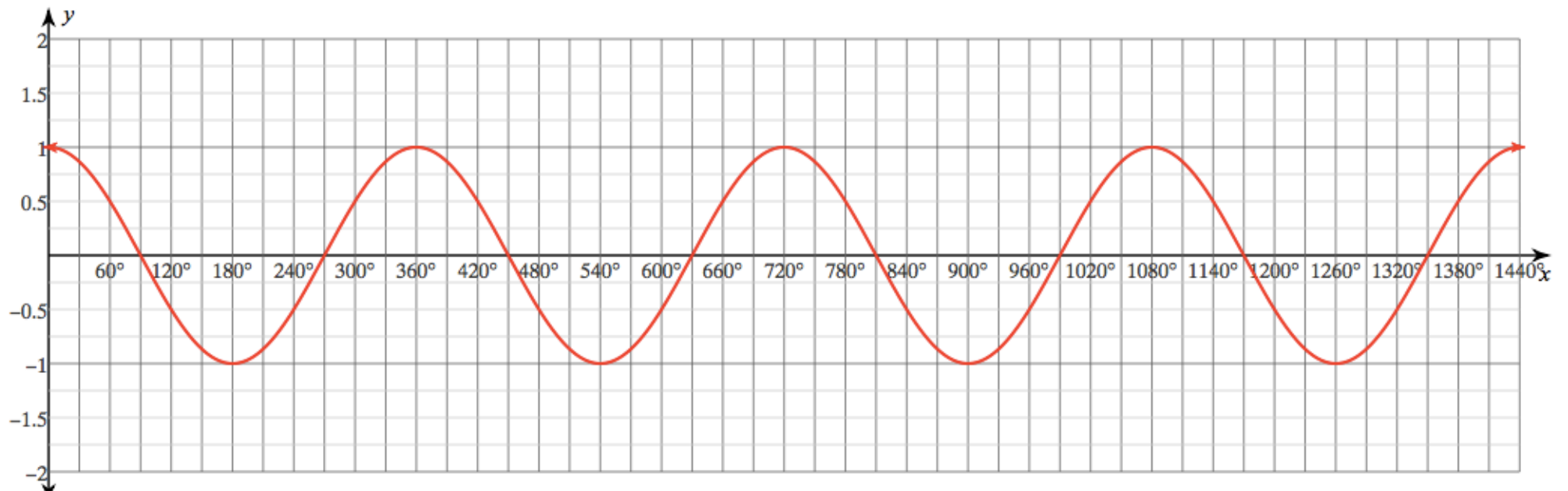
Find the angle coterminal to $-\frac{19\pi}{4}$.

$$-\frac{19\pi}{4} + 2\pi(3) = \frac{5\pi}{4}$$

$$\sec \frac{5\pi}{4} = -\frac{2}{\sqrt{2}} = -\frac{2\sqrt{2}}{2} = -\sqrt{2}$$

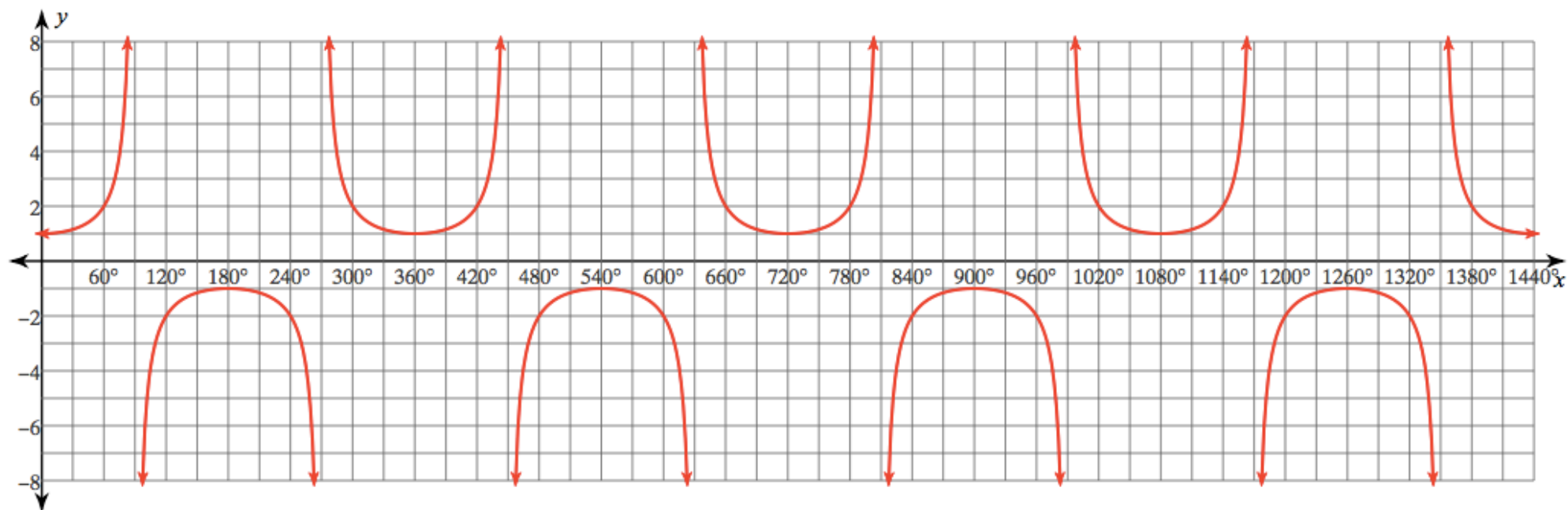


1) $y = \cos x$



The secant graph...

2) $y = \sec x$

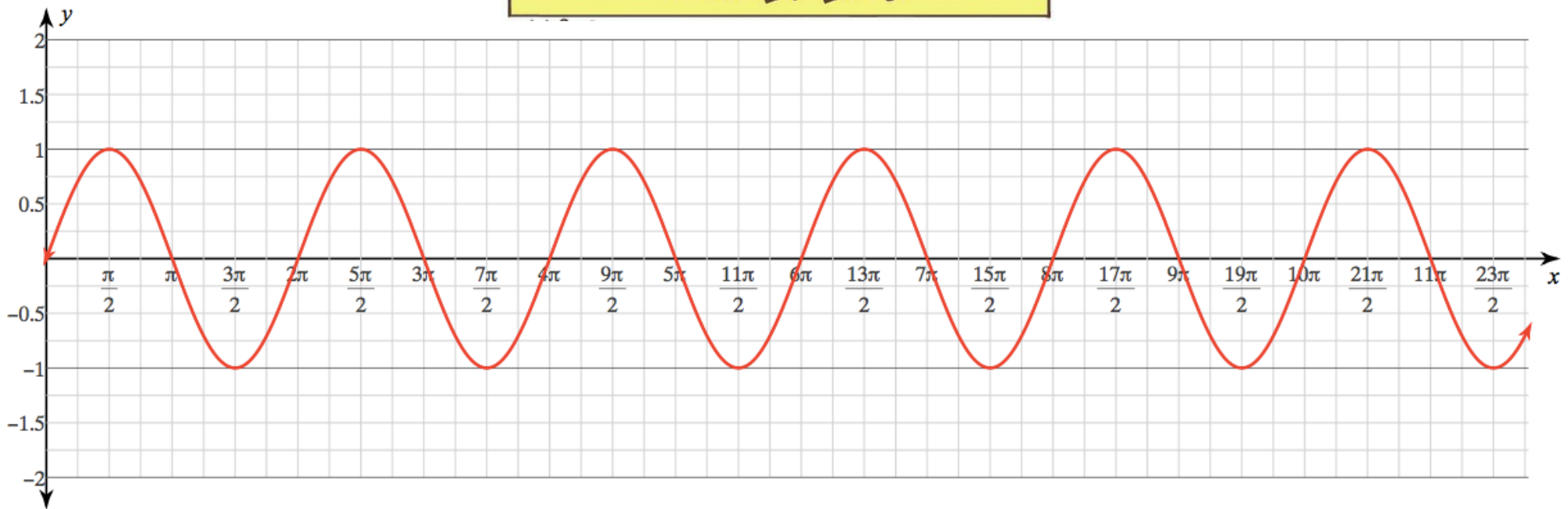


You feel sick, you feel fine,
you feel sick, you feel fine--
you have the SINE FLU!



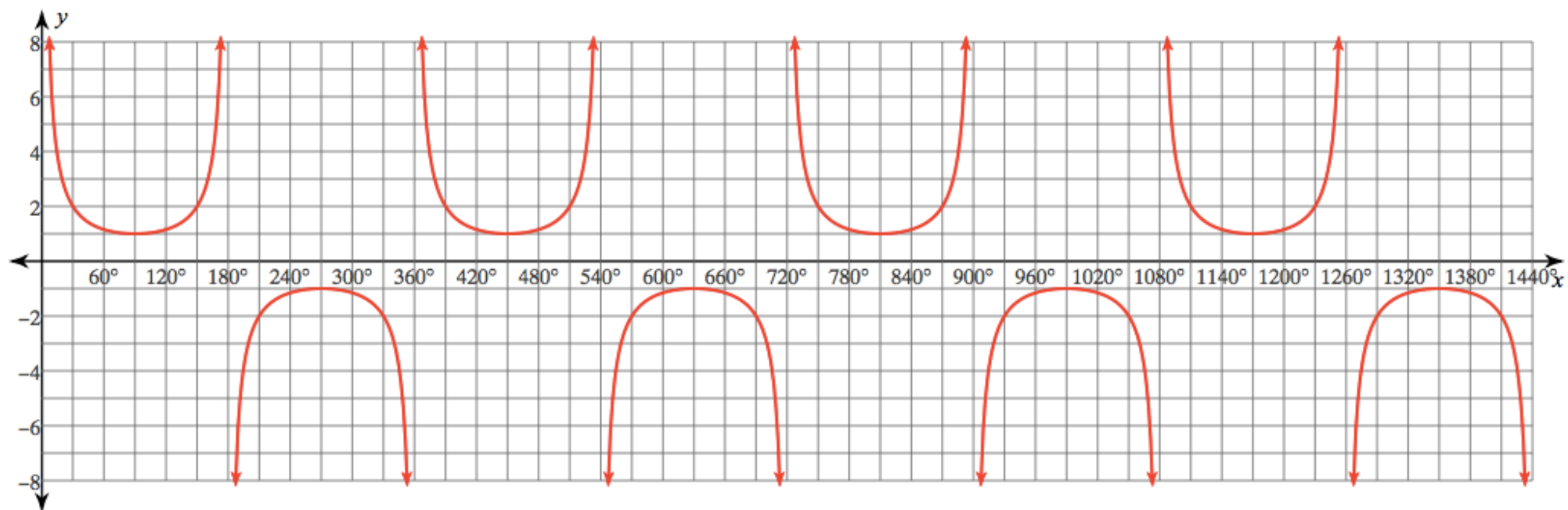
SINEFELD

$$y = \sin x$$



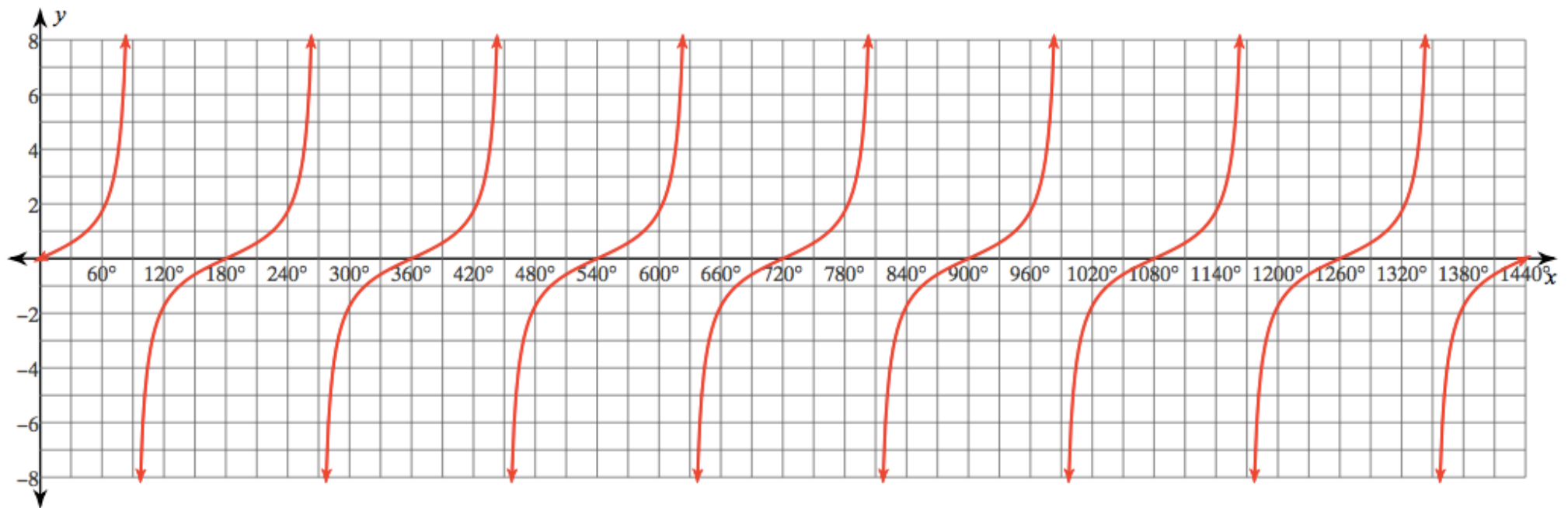
The cosecant graph...

3) $y = \csc x$



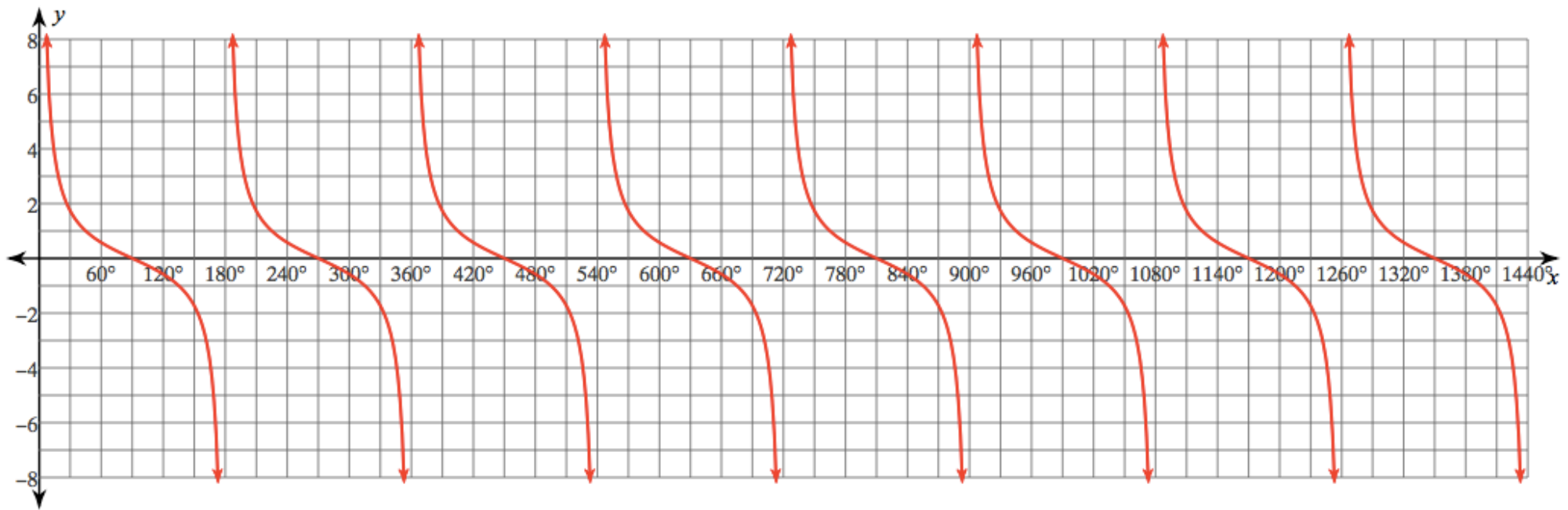
The tangent graph...

1) $y = \tan x$



The cotangent graph...

4) $y = \cot x$



Beautiful Dance Moves



$\sin(x)$



$\cos(x)$



$\tan(x)$



$\cot(x)$



$|x|$



x



x^2



$x^2 + y^2$



\sqrt{x}



$\sqrt{-x}$



$\frac{1}{x}$



crap.