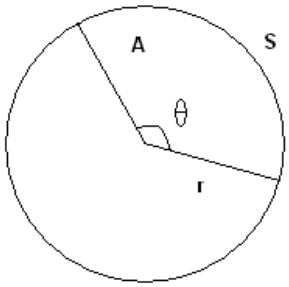
MSLC – Math 1149
Exam 1 Review

Disclaimer: This should NOT be used as your only guide for what to study.

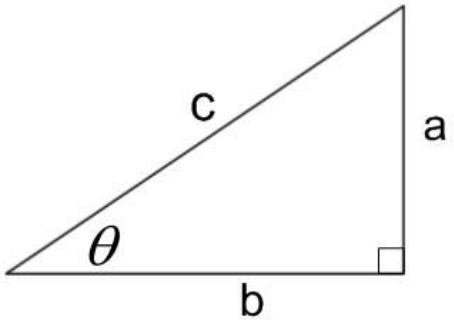
1. In the circle pictured below, r is the radius of the circle, θ is the central angle of the sector, A is the area of the sector, and s is the length of the arc subtended by the central angle. Find:



   a. A and s if $r = 3$ inches, and $\theta = \frac{\pi}{3}$ radians
   b. r and s if $A = 2.25$ square miles, and $\theta = 36°$
   c. A and θ if $r = 4$ meters, and $s = 12.57$ meters
   d. r and A if $s = 13$ meters, and $\theta = \frac{\pi}{4}$ radians

2. Find the five remaining trigonometric ratios of θ, given that θ is an acute angle.

   a. $a = 8, b = 15$
   b. $a = 12, c = 13$
   c. $\sin\theta = \frac{2}{7}$
   d. $\cot\theta = 3$
   e. $\cos\theta = \frac{3}{5}$
   f. $\csc\theta = \sqrt{5}$



3. Find the five remaining trigonometric ratios of θ, using the information provided.

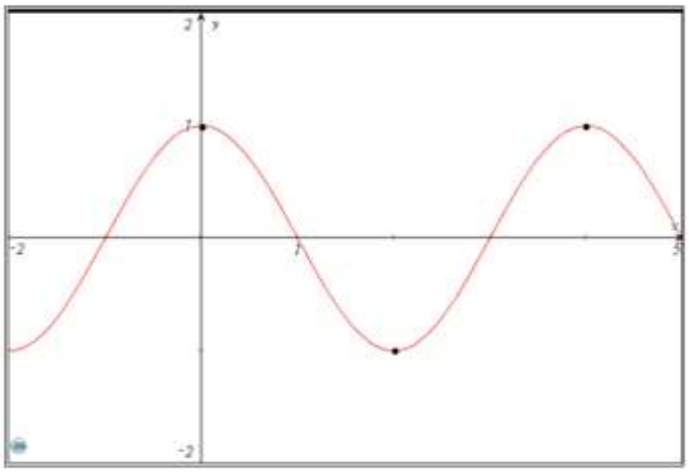
   a. $\csc\theta = -\sqrt{65}$ and $\cot\theta > 0$
   b. $\sec\theta = -\frac{13}{4\sqrt{3}}$ and $\sin\theta > 0$
   c. $\tan\theta = -\frac{35}{12}$ and $\cos\theta > 0$

4. Find the period, amplitude, and phase-shift of the given trigonometric equation, then graph one complete period.

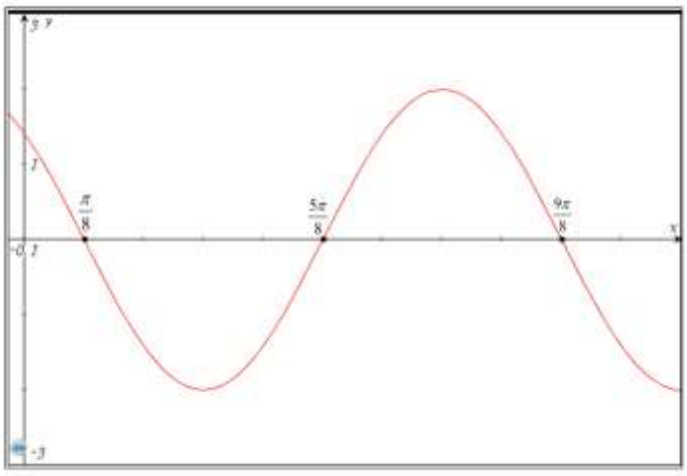
   a. $y = 3\sin(\pi x)$
   b. $y = 2\cos 4\left(x + \frac{\pi}{6}\right)$
   c. $y = -5\sin\left(2x + \frac{\pi}{4}\right)$

5. Given the following graph, find an equation that will satisfy the given conditions.

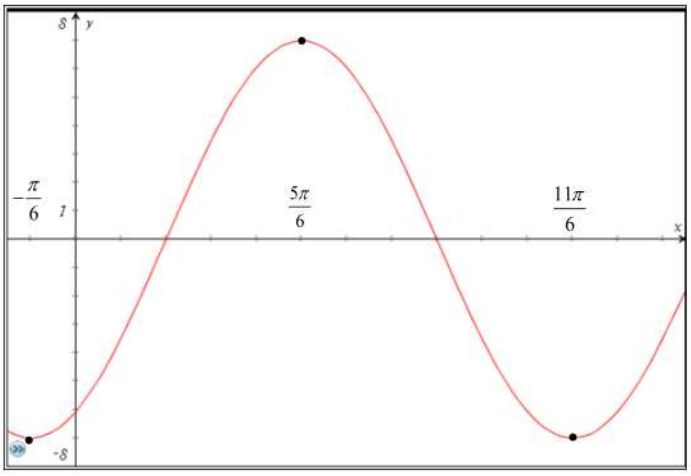
a. $y = a\cos k(x-b)$



b. $y = a\sin k(x-b)$



c. $y = a\cos k(x-b)$



6. Graph a complete period of each of the following. Use dotted lines to indicate any asymptotes.

a. $y = \cot\left(3x - \frac{\pi}{2}\right)$

b. $y = -2\sec\left(x + \frac{\pi}{6}\right)$

ANSWERS

1. a. $s = 3.142$ inches $A = 4.712$ in^2 b. $r = 2.676$ miles $s = 1.681$ miles

c. $\theta = \pi$ (radians) $A = 25.13$ m^2 d. $r = 16.552$ meters $A = 107.589$ m^2

2. a. $\sin\theta = \frac{8}{17}$ $\cos\theta = \frac{15}{17}$ $\tan\theta = \frac{8}{15}$ $\csc\theta = \frac{17}{8}$ $\sec\theta = \frac{17}{15}$ $\cot\theta = \frac{15}{8}$

b. $\sin\theta = \frac{12}{13}$ $\cos\theta = \frac{5}{13}$ $\tan\theta = \frac{12}{5}$ $\csc\theta = \frac{13}{12}$ $\sec\theta = \frac{13}{5}$ $\cot\theta = \frac{5}{12}$

c. $\sin\theta = \frac{2}{7}$ $\cos\theta = \frac{\sqrt{45}}{7}$ $\tan\theta = \frac{2}{\sqrt{45}}$ $\csc\theta = \frac{7}{2}$ $\sec\theta = \frac{7}{\sqrt{45}}$ $\cot\theta = \frac{\sqrt{45}}{2}$

d. $\sin\theta = \frac{1}{\sqrt{10}}$ $\cos\theta = \frac{3}{\sqrt{10}}$ $\tan\theta = \frac{1}{3}$ $\csc\theta = \sqrt{10}$ $\sec\theta = \frac{\sqrt{10}}{3}$ $\cot\theta = 3$

e. $\sin\theta = \frac{4}{5}$ $\cos\theta = \frac{3}{5}$ $\tan\theta = \frac{4}{3}$ $\csc\theta = \frac{5}{4}$ $\sec\theta = \frac{5}{3}$ $\cot\theta = \frac{3}{4}$

f. $\sin\theta = \frac{1}{\sqrt{5}}$ $\cos\theta = \frac{2}{\sqrt{5}}$ $\tan\theta = \frac{1}{2}$ $\csc\theta = \sqrt{5}$ $\sec\theta = \frac{\sqrt{5}}{2}$ $\cot\theta = 2$

3. a. θ is in Quadrant III $\sin\theta = -\frac{1}{\sqrt{65}}$; $\cos\theta = -\frac{8}{\sqrt{65}}$; $\tan\theta = \frac{1}{8}$

$\csc\theta = -\sqrt{65}$ $\sec\theta = -\frac{\sqrt{65}}{8}$ $\cot\theta = 8$

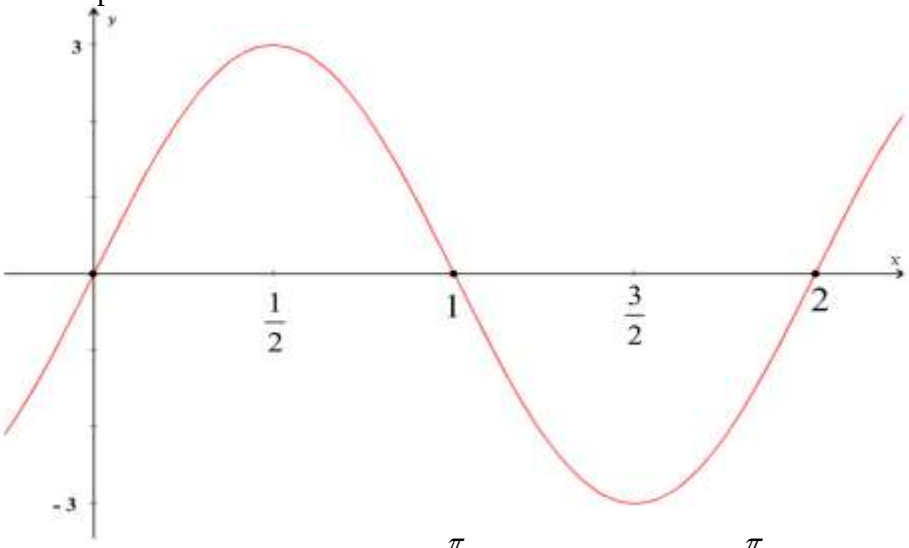
b. θ is in Quadrant II $\sin\theta = \frac{11}{13}$ $\cos\theta = -\frac{\sqrt{48}}{13}$ $\tan\theta = -\frac{11}{\sqrt{48}}$

$\csc\theta = \frac{13}{11}$ $\sec\theta = -\frac{13}{\sqrt{48}}$ $\cot\theta = -\frac{\sqrt{48}}{11}$

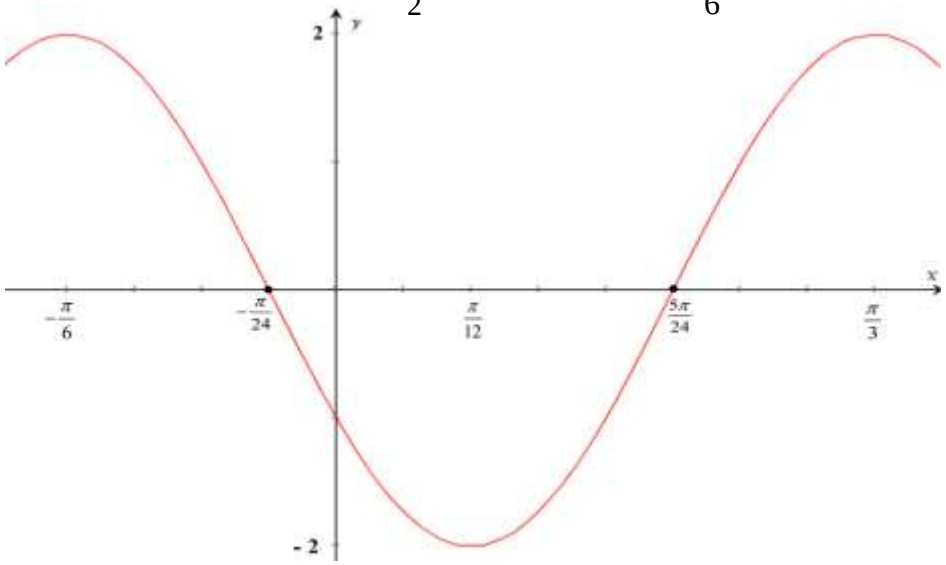
c. θ is in Quadrant IV $\sin\theta = -\frac{35}{37}$ $\cos\theta = \frac{12}{37}$ $\tan\theta = -\frac{35}{12}$

$\csc\theta = -\frac{37}{35}$ $\sec\theta = \frac{37}{12}$ $\cot\theta = -\frac{12}{35}$

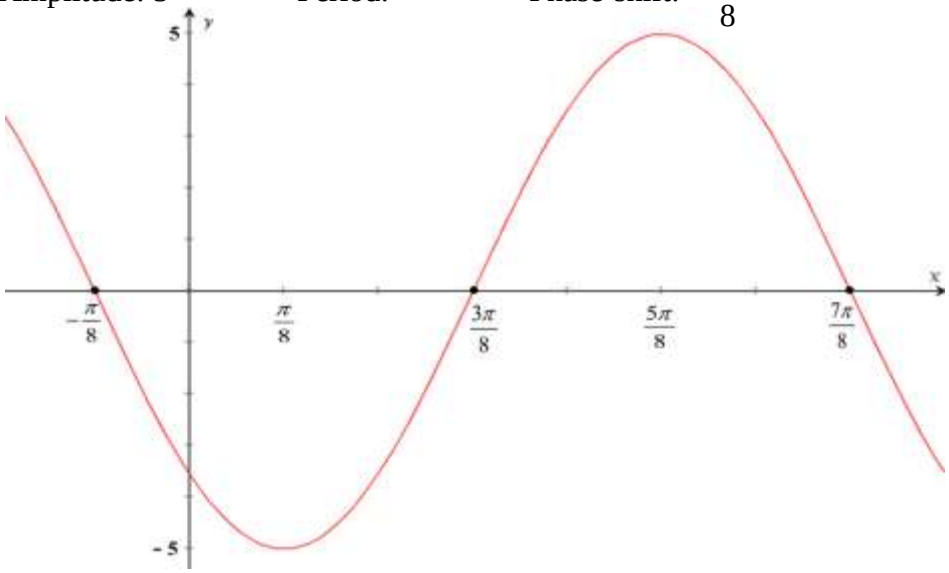
4. a. Amplitude: 3 Period: 2 Phase-shift: none



b. Amplitude: 2 Period: $\frac{\pi}{2}$ Phase-shift: $-\frac{\pi}{6}$

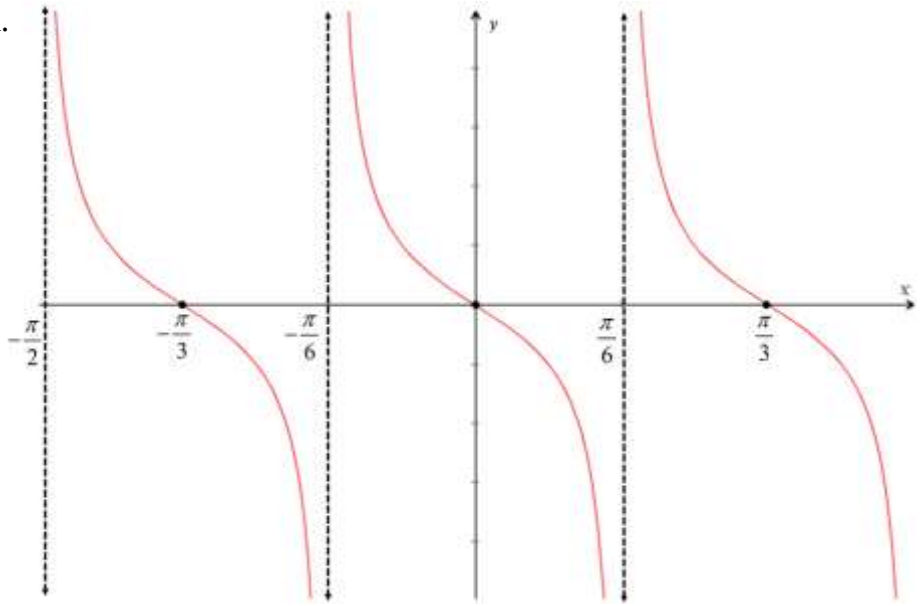


c. Amplitude: 5 Period: π Phase-shift: $-\frac{\pi}{8}$



5. a. $f(x)=\cos\left(\frac{\pi}{2}x\right)$ b. $g(x)=-2\sin 2\left(x-\frac{\pi}{8}\right)$ c. $h(x)=-7\cos\left(x+\frac{\pi}{6}\right)$

6. a.



b.