SEMESTER 2 FINAL EXAM REVIEW

ARC LENGTH,RADIAN MEASURE,CIRCULAR MOTION

1. Consider an object moving on a circular path with a radius of 4.2 meters.

   a. How many degrees are swept out when the object travels 19 meters on the circular path?
   b. How many meters does the object travel when it sweeps out $\frac{5\pi}{9}$ radians on the circular path?
   c. What does it mean for the object to travel 2.5 radians?
   d. Suppose the distance the object traveled on the circular path varied from 3.2 meters to 8.3 meters. How many radians did the object sweep out over this distance?

SIX TRIG FUNCTIONS

2. Find the exact values of the six trig functions of θ. Sketch the angle in standard position.

$\sin\theta = -\frac{7}{13}$; θ in Q3 $\quad\quad$ $\cos\theta =$ $\quad\quad$ $\sec\theta =$

$\sin\theta =$ $\quad\quad$ $\csc\theta =$

$\tan\theta =$ $\quad\quad$ $\cot\theta =$

ARC LENGTH,RADIAN MEASURE,CIRCULAR MOTION

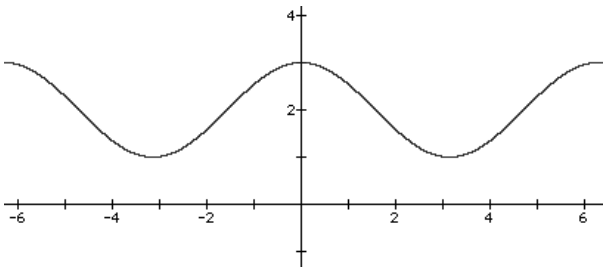
3. Find the radian and degree measure of the central angle associated with:

   a. An arc that is 14.5 cm in a circle with a diameter of 8 cm.
   b. An arc that is 20.2 cm in a circle with a radius of 4 cm.
   c.

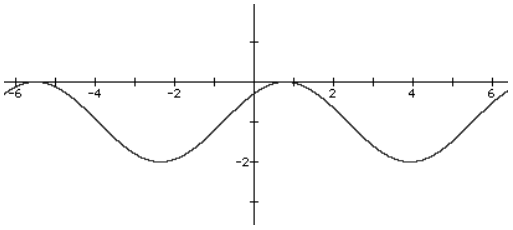
GRAPHS OF TRIG FUNCTIONS

4. Determine the phase shift and vertical shift of each function. Then write an equation of each graph.

   a)



   b)



5. Consider the function $f(x) = 2\sin(3x) - 4$

a) Describe in detail what the 2 in the function represents.

b) Describe in detail that the 3 in the function represents.

c) Describe in detail what the -4 in the function represents.

d) What is the period of the function?

e) What is the amplitude of the function?

f) What is the midline of the function?

g) Graph one full period of the function and label the five critical points.

6. Graph $y = \tan(x) - 3$. Determine the vertical asymptotes and the critical values for two full periods.

7. Graph the sine and cosine curve on one coordinate plane. Decide if sine and cosine is increasing or decreasing in each quadrant. Fill in the following table.

	Quadrant I	Quadrant II	Quadrant III	Quadrant IV
Sine Function				
Cosine Function				

8. Graph the following equation in the space below. Be sure to label any key points. All points should be in π units for the x values (no decimals). Graph only one period.

$$y = 3\cos\left(x - \frac{\pi}{2}\right) + 2$$

Amplitude_____ Period _____ Phase Shift _____ Vertical Shift _____ Right Endpoint_____

INVERSE TRIG FUNCTIONS

For problems 9 – 11 evaluate each expression.

9. $\arcsin(-1) =$ _____ **10.** $\cos^{-1}(1) =$ _____ **11.** $\tan^{-1}\left(\tan\frac{11\pi}{6}\right) =$ _____

12. If possible, find the exact value.

a. $\arcsin\left(-\frac{1}{2}\right)$ **b.** $\sin^{-1}\left(\frac{\sqrt{3}}{2}\right)$ **c.** $\sin^{-1}(2)$

13. Find the exact value.

a. $\arccos\left(\frac{\sqrt{2}}{2}\right)$ **b.** $\arctan(0)$ **c.** $\tan^{-1}(-1)$

14. Use a sketch to find the exact value.

a. $\tan\left(\arccos\frac{2}{3}\right)$ **b.** $\cos\left[\arcsin\left(-\frac{3}{5}\right)\right]$

15. Find the value of $cos^{-1}\left(\sin\frac{5\pi}{6}\right)$

16. Find the value of $sin^{-1}\left(\cos\frac{5\pi}{6}\right)$

SIMPLIFYING TRIG EXPRESSIONS

17. If sinxcotx=1 find the value of cosx.

18. If sinxsecx=3 find the value of cotx.

LAW OF SINES/LAW OF COSINES

19. For triangle ABC, $A = 35°$, $B = 50°$, and a = 16 feet. Find the remaining angles and sides.

20. Find the 3 angles of the triangle whose sides have length a = 6, b = 8, and c = 12.

SUM/DIFFERENCE IDENTITIES and DOUBLE ANGLE IDENTITIES

21. Find the exact value of: **a)** $\cos 75^\circ$ **b)** $\sin 75^\circ$ **c)** $\tan 75^\circ$

22. Given $\cos\theta = \frac{5}{13}$, and $\frac{3\pi}{2} < \theta < 2\pi$ find $\sin 2\theta$, $\cos 2\theta$, $\tan 2\theta$

23. If $\cos\theta = 0.6, and\, 0^\circ < \theta < 90^\circ$, find the exact value of $\sin 2\theta$.

24. Find the expression as the sine or cosine of an angle

a) $\sin 42^\circ \cos 17^\circ - \cos 42^\circ \sin 17^\circ$

b) $\cos 94^\circ \cos 18^\circ + \sin 94^\circ \sin 18^\circ$

SOLVING TRIG EQUATIONS

25. Find all solutions of $2\cos^2 x - 5\cos x + 2 = 0$ in the interval $[0, 2\pi)$.

26. Solve $2\sin^2 x - \sin x - 1 = 0$ for all real values of x.

27. Solve $2\sin^2 x - 3\sin x + 1 = 0$ for all real values of x.

SIMPLIFYING TRIG EXPRESSIONS

Simplify:

28. $\dfrac{\sin\theta}{\tan\theta}$ 29. $\sec^2\theta - \tan^2\theta$ 30. $\cos\theta\tan^2\theta + \cos\theta$ 31. $\dfrac{1-\sin^2\theta}{1-\cos^2\theta}$

POLAR COORDINATES AND EQUATIONS

32. Write the polar equation $r^2 - 3rcos\theta = 0$ in rectangular form.

33. Find the polar coordinates of the given point in rectangular form. $(-3\sqrt{3},3)$

34. Express $5\left(\cos\dfrac{\pi}{4} + i\sin\dfrac{\pi}{4}\right)$ in rectangular form.

35. Simplify $(1 - \sqrt{3}i)^3$ and express in rectangular form.