9) Describe the transformations of a basic trigonometric function which would result in the function below:

a) $y = -3\cos(x + 3) - 5$

b) $y = 0.7\sin(3x - 4) + 1$

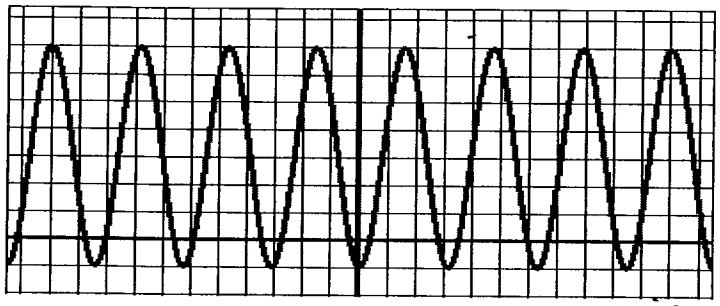
10) Construct a sinusoidal function using the information given: (this means give an equation)

a) A cosine curve with reflected over x-axis, vertically stretched by a factor of 3, horizontally stretched by a factor of 2 and shifted left 4 units.

b) A sine curve reflected over the y-axis, vertically shrunk by a factor of 1/3, horizontally shrunk by a factor of 3, and shifted up 7 units.

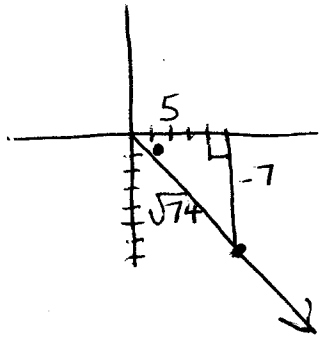
c) Maximum located at (3, 1) & minimum located at (4, -7).

d) This is a cosine function graphed in a window $[-4\pi, 4\pi]$ by $[-2, 8.3]$



11) Find $\sec\theta$ given that the terminal side of θ passes through the point (5, -7)

$\sec\theta = \frac{\sqrt{74}}{5}$



$m^2 = 5^2 + (-7)^2$

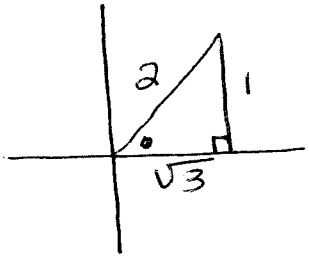
$m = \sqrt{74}$

12) Given that $\csc\theta = \frac{2}{1}$ and $\cos\theta > 0$ find θ and $\cos\theta$.

pos quad 1 & 2

pos quad 1 & 4

$\theta = \frac{\pi}{6}$ $\cos\theta = \frac{\sqrt{3}}{2}$



$2^2 = 1^2 + m^2$

$3 = m^2$

$m = \sqrt{3}$

13) Give the exact value for each expression:

a) tan (330°) $\frac{-\frac{1}{2}}{\frac{\sqrt{3}}{2}} = -\frac{1}{\sqrt{3}} = \frac{-\sqrt{3}}{3}$

b) cos(7π/3) $\frac{1}{2}$

c) sin(–7π/6) $\frac{1}{2}$

d) sec(–135°) $-\frac{2}{\sqrt{2}} = -\sqrt{2}$

e) cot (7π/4) $\frac{\frac{\sqrt{2}}{2}}{-\frac{\sqrt{2}}{2}} = -1$

f) sin (270°) -1

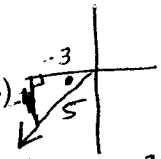
g) cos(2π) 1

h) tan(π/2) $\frac{1}{0}$ undefined

i) csc(–3π/2) 1

j) cot (5π/2) $\frac{0}{1} = 0$

14) Find cosθ & sinθ given that the side of θ passes through the point (-3, -4).



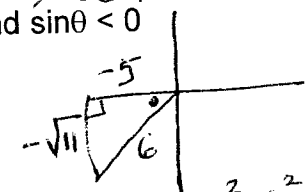
cosθ = $\frac{-3}{5}$ & sinθ = $\frac{-4}{5}$

$(-3)^2+(-4)^2=m^2$

$m=5$

15) Given that secθ = -6/5 and sinθ < 0 find tan θ and cos θ.

neg 2nd & 3rd neg 3rd & 4th



tan θ = $\frac{\sqrt{11}}{5}$ cos θ = $\frac{-5}{6}$

$m^2+(-5)^2=6^2$

$m=-\sqrt{11}$

18) $\cos^{-1}(\cos(3\pi/4)) = \frac{3\pi}{4}$

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

19) $\sin^{-1}(\tan(\pi/4)) = \frac{\pi}{2}$

$\sin^{-1}(1)$

16) Find a positive and a negative angle co-terminal with 70°. (+) 430° & (–) 290°

$\pm 360°$

17) Find the length of an arc with central angle of 45° and a radius of 7in. $45° \cdot \frac{\pi}{180} = \frac{\pi}{4}$

$s = r\theta$

$s = 7\left(\frac{\pi}{4}\right) = \boxed{\frac{7\pi}{4} \text{ inches}}$

18) Find the radius of a circle with a central angle of 6π/7 intercepting an arc of length π cm.

$s = r\theta$

$\pi = r\left(\frac{6\pi}{7}\right)$

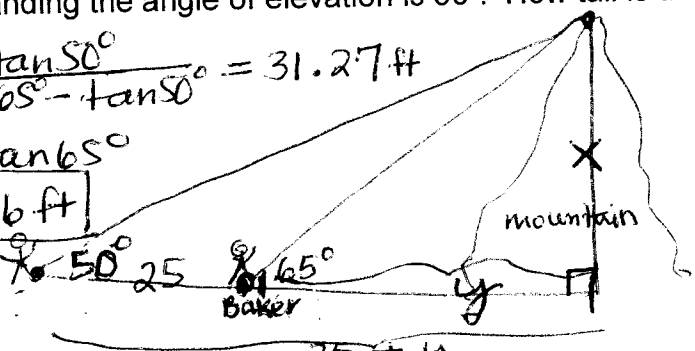
$r = \frac{\pi}{\frac{6\pi}{7}} = \pi \cdot \frac{7}{6\pi} = \boxed{\frac{7}{6} \text{ cm}}$

19) The Roach brother's Chevy Nova has wheels with 36 in diameter. If the wheels are rotating at 630 rpm, find the nova's speed in miles per hour. $d = 36\text{in} \Rightarrow r = 18\text{ in}$

$\omega = \frac{630 \text{ rev}}{1 \text{ min}} \cdot \frac{2\pi \text{ rad}}{1 \text{ rev}} = 1260\pi \text{ rad/min}$

$V = r\omega = 18(1260\pi) = 22680\pi \text{ in/min} \cdot \frac{1 \text{ ft}}{12 \text{ in}} \cdot \frac{1 \text{ mile}}{5280 \text{ ft}} \cdot \frac{60 \text{ min}}{1 \text{ hr}} = \boxed{45 \text{ mph}}$

20) Mr. Baker is taking the backpacking club on a hike. From where he is standing the angle of elevation to the top of the mountain is 65°. Another student is standing 25ft away, and from where she is standing the angle of elevation is 50°. How tall is the mountain?



$y = \frac{25\tan 50°}{\tan 65° - \tan 50°} = 31.27\text{ ft}$

$x = y \cdot \tan 65°$

$\boxed{x = 67.06\text{ ft}}$

$\tan 65° = \frac{x}{y} \rightarrow x = y \cdot \tan 65°$

$\tan 50° = \frac{x}{25+y}$

$\frac{\tan 50°}{1} = \frac{y \tan 65°}{25+y}$

$y\tan 65° = 25\tan 50° + y\tan 50°$

$y(\tan 65° - \tan 50°) = 25\tan 50°$