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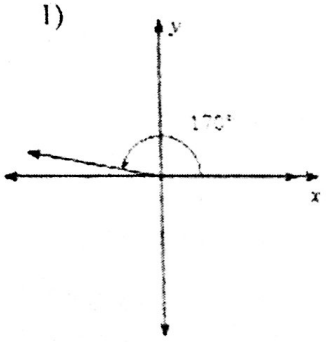
Honors Algebra II Trigonometry Test -- Show All of Your Work for Credit!!
Box All Answers!!
Calculators are prohibited on this portion of the test

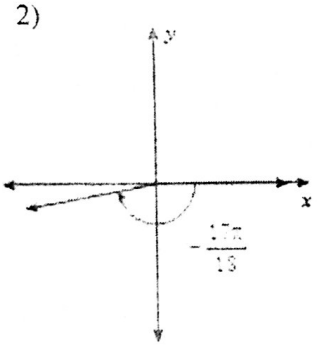
Find a positive & negative co-terminal angle for each given angle.

1) (2pts)



530° -190°

2) (2pts)



$\frac{19\pi}{18}$ $\frac{-53\pi}{18}$

$\frac{19\pi}{18}\left(\frac{180^\circ}{\pi}\right) = 190^\circ$

$\frac{-53\pi}{18}\left(\frac{180^\circ}{\pi}\right) = -53^\circ$

For each given angle, convert the radian measure to degrees and the degree measure to radians. (2pts each)

3) $-300^\circ\left(\frac{\pi}{180^\circ}\right) = \frac{-300\pi}{180}$ $\frac{30\pi}{18} = \frac{10\pi}{6}$

$= \frac{-15\pi}{9} = -\frac{5\pi}{3}$

4) $\frac{7\pi}{4}\left(\frac{180}{\pi}\right) = 315^\circ$

Fill in the table below using the information given. *(1pt each)*

	Degree	Radians	Sin	Cos	Tan
5)	120°	$\frac{2\pi}{3}$	$\frac{\sqrt{3}}{2}$	$-\frac{1}{2}$	$-\sqrt{3}$
6)	135°	$\frac{3\pi}{4}$	$\frac{\sqrt{2}}{2}$	$-\frac{\sqrt{2}}{2}$	-1
7)	-90°	$-\frac{\pi}{2}$	-1	0	undefined
8)	30°	$\frac{\pi}{6}$	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{3}}{3}$
9)	330°	$\frac{11\pi}{6}$	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$-\frac{\sqrt{3}}{3}$

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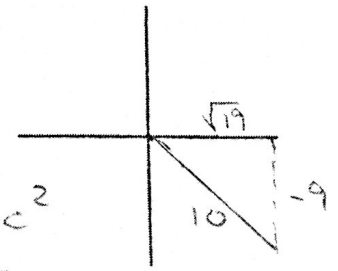
Use the given point on the terminal side of angle θ to find the value of all six trig functions. (6pts)

10) $(\sqrt{19}, -9)$



$\sqrt{19}^2 + (-9)^2 = c^2$

$19 + 81 = c^2$

$100 = c^2$

$10 = c$

$\sin\theta = \frac{-9}{10}$ $\quad \csc\theta = \frac{-10}{9}$

$\cos\theta = \frac{\sqrt{19}}{10}$ $\quad \sec\theta = \frac{10\sqrt{19}}{19}$

$\tan\theta = \frac{-9\sqrt{19}}{19}$ $\quad \cot\theta = -\frac{\sqrt{19}}{9}$

Find the exact value of each trigonometric function. *(2pts each)*

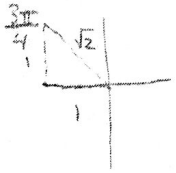
11) $\cos 150^\circ = -\frac{\sqrt{3}}{2}$

12) $\tan 765^\circ = 1$

13) $\sin 330^\circ = -\frac{1}{2}$

14) $\csc\pi = \frac{1}{\sin\pi} = \frac{1}{0}$ undefined

15) $\sec\frac{3\pi}{4} = -\sqrt{2}$



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

16) $\sin(-\pi) = 0$

Graph each function using radians. State the period, amplitude, phase shift, vertical shift, domain, and the range. In the table, state the points of the maximums, the intercepts and the minimums. (9pts each)

17) $y = \sin\left(\frac{\theta}{2} + \frac{\pi}{3}\right)$ → $y = \sin\frac{1}{2}\left(\theta + \frac{2\pi}{3}\right)$

x	y
$-\frac{2\pi}{3}$	0
$\frac{\pi}{3}$	1
$\frac{4\pi}{3}$	0
$\frac{7\pi}{3}$	-1
$\frac{10\pi}{3}$	0

Period 4π

Amplitude 1

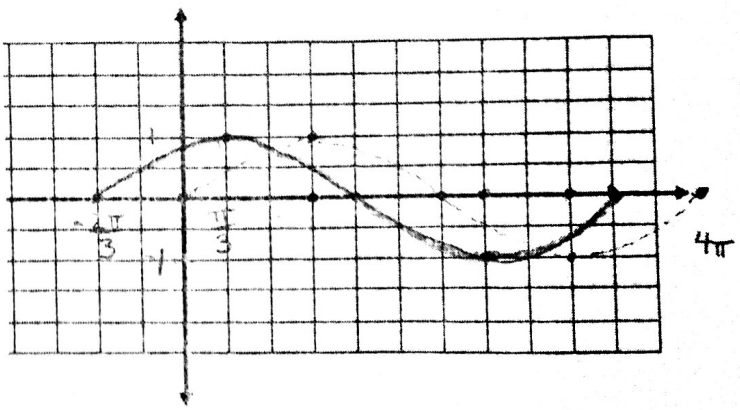
Phase Shift $-2\pi/3$

Vertical Shift 0

Domain $(-\infty, +\infty)$

Range $[-1, +1]$

(6pts)



(3pts)

$\frac{\theta}{2} + \frac{\pi}{3} = 0$

$\theta = -\frac{2\pi}{3}$

$P = \frac{2\pi}{\frac{1}{2}}$

$P = 4\pi$

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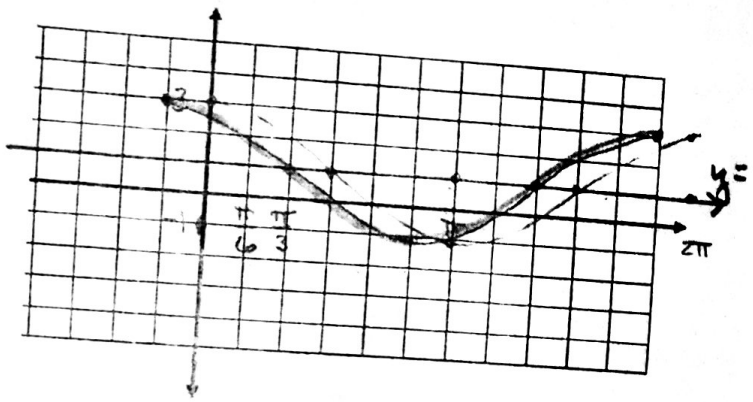
18) $y = 2\cos\left(\theta + \frac{\pi}{6}\right) + 1$ $P = 2\pi$

Period 2π
Amplitude 2
Phase Shift $-\frac{\pi}{6}$
Vertical Shift $+1$
Domain $(-\infty, +\infty)$
Range $[-1, 3]$

x	y
$-\frac{\pi}{6}$	3
$\frac{\pi}{3}$	1
$\frac{5\pi}{6}$	-1
$\frac{4\pi}{3}$	1
$\frac{11\pi}{6}$	3

$\frac{8\pi}{6}$



19) $y = \sin\left(2\theta - \frac{\pi}{2}\right) + 2$

$y = \sin 2\left(\theta - \frac{\pi}{4}\right) + 2$

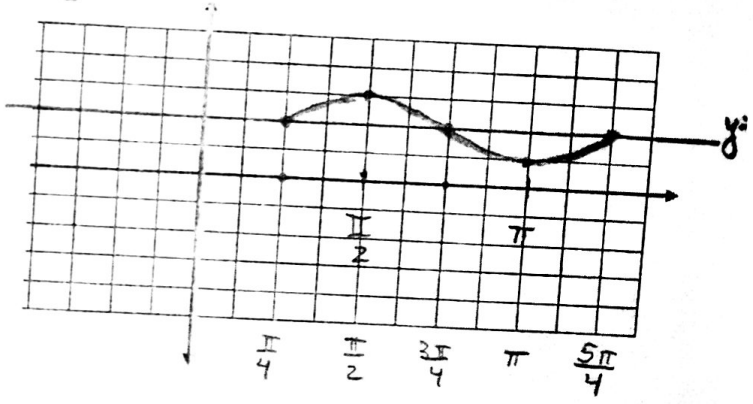
$2\theta - \frac{\pi}{2} = 0$

$\theta = \frac{\pi}{4}$

$P = \frac{2\pi}{2}$

Period π
Amplitude 1
Phase Shift $\pi/4$
Vertical Shift 2
Domain $(-\infty, +\infty)$
Range $[1, 3]$

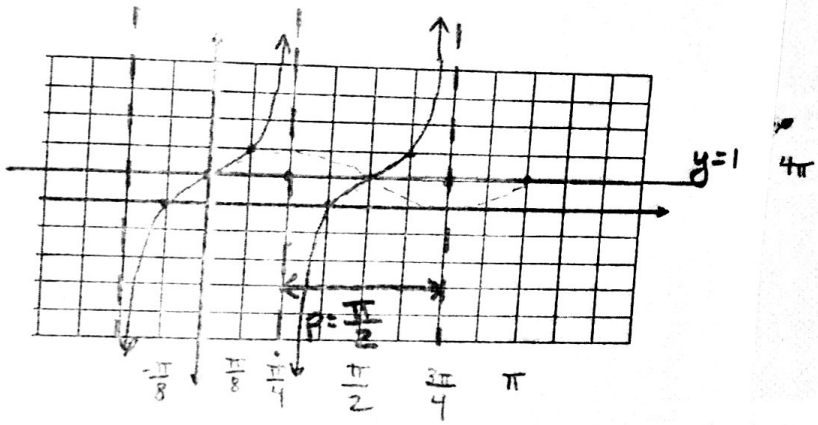
x	y
$\frac{\pi}{4}$	2
$\frac{\pi}{2}$	3
$3\pi/4$	2
π	1
$\frac{5\pi}{4}$	2



20) $y = 1 + \tan(2\theta)$

Period $\frac{\pi}{2}$
Amplitude NA
Phase Shift 0
Vertical Shift $+1$
Domain $(-\infty, +\infty)$ except $\frac{\pi}{4} + n\left(\frac{\pi}{2}\right)$
Range $(-\infty, +\infty)$

x	y
$-\frac{\pi}{8}$	0
0	1
$\frac{\pi}{8}$	2
$\frac{3\pi}{8}$	0
$\frac{\pi}{2}$	1



$y = \tan 2x + 1$ $P = \frac{\pi}{2}$

$y = \sin 2x + 1$ $P = \frac{2\pi}{2} = \pi$

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You may use a calculator on this portion of the test

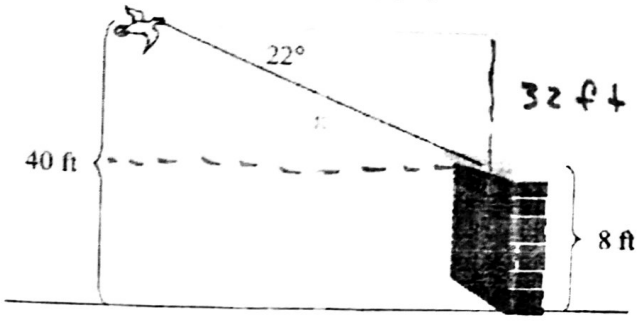
21) A bird is flying at a height of 40 feet and spots an 8-ft ledge on which to perch. If the top of the ledge is at a 22° angle of depression from the bird, how far must the bird fly before it can land? (3pts)

$\sin 22^\circ = \frac{32}{x}$

$x = \frac{32}{\sin 22}$

$x \approx 85.4$

$x =$ 85.4 ft



Solve each triangle. Assume the triangle is NOT a right triangle. Round your answers to the nearest tenth. (5pts each)

22) $A = 23^\circ$ $B = 57^\circ$ $C = 100$

$a = 11$ $b = 23.6$ $c = 27.7$

$180 - 23 - 57 = 100$

$\frac{b}{\sin 57} = \frac{11}{\sin 23}$

$b = \frac{11(\sin 57^\circ)}{\sin 23^\circ}$

$b \approx 23.6$

$\frac{c}{\sin 100} = \frac{11}{\sin 23^\circ}$

$c = \frac{11(\sin 100)}{\sin 23^\circ}$

$c \approx 27.7$

23) $A = 111.3$ $B = 38.4$ $C = 30.3^\circ$

$a = 24$ $b = 16$ $c = 13$

$(24)^2 = 16^2 + 13^2 - 2(16)(13)\cos\angle A$

$576 = 425 - 416\cos\angle A$

$151 = -416\cos\angle A$

$-.3629 = \cos\angle A$

$\angle A \approx 111.28^\circ$

$\frac{\sin\angle B}{16} = \frac{\sin 111.3}{24}$

$\angle B \approx \sin^{-1}\left(\frac{16(\sin 111.3)}{24}\right)$

$\angle B \approx 38.4$

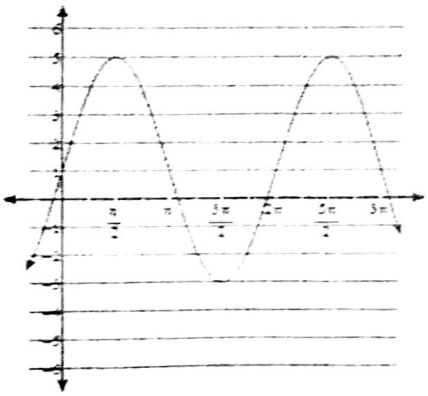
$\frac{\sin\angle C}{13} = \frac{\sin 111.3}{24}$

$\angle C \approx \sin^{-1}\left(13\ \frac{\sin 111.3}{24}\right)$

$\angle C \approx 30.3$

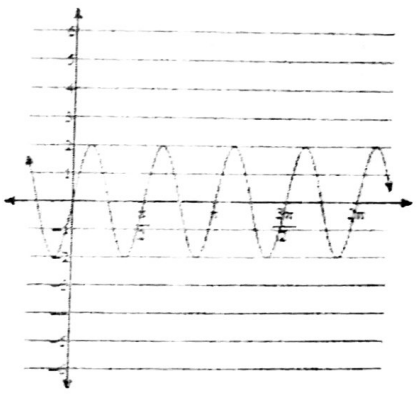
Given each graph below, write the equation of the sine function in the form of $y = A\sin(Bx) + C$. (3pts each)

24)



$y =$ 4 Sin θ + 1

25)



$y =$ 2 Sin 4x