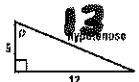
9.1	9.2	9.3	10.1	10.2	10.3
10	10	10	10	10	10
20	20	20	20	20	20
30	30	30	30	30	30
40	40	40	40	40	40
50	50	50	50	50	50

9.1 – 10 Points

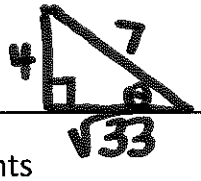
Evaluate the six trigonometric functions of the angle θ.



$\sin\theta = \frac{12}{13}$ $\csc\theta = \frac{13}{12}$

$\cos\theta = \frac{5}{13}$ $\sec\theta = \frac{13}{5}$

$\tan\theta = \frac{12}{5}$ $\cot\theta = \frac{5}{12}$



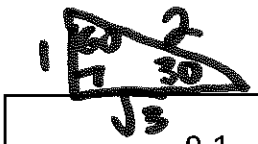
9.1 – 20 Points

If θ is an acute angle of a right triangle and $\sin\theta = \frac{4}{7}$, what is $\tan\theta$?

$\sin\theta = \frac{4}{7}$ $\csc\theta = \frac{7}{4}$

$\cos\theta = \frac{\sqrt{33}}{7}$ $\sec\theta = \frac{7\sqrt{33}}{33}$

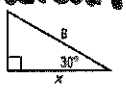
$\tan\theta = \frac{4\sqrt{33}}{33}$ $\cot\theta = \frac{\sqrt{33}}{4}$



9.1 – 30 Points

radical form

Find the value of x for the right triangle shown.



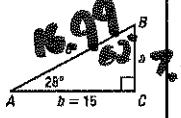
$\cos 30° = \frac{x}{8}$ $\frac{2x}{2} = \frac{8\sqrt{3}}{2}$

$\frac{\sqrt{3}}{2} = \frac{x}{8}$ $x = 4\sqrt{3}$

9.1 – 40 Points

2 dec places

Solve $\triangle ABC$.



$\tan 28° = \frac{a}{15}$ $\frac{c}{\cos 28°} = \frac{15}{\cos 28°}$

$\frac{\cos 28°}{1} = \frac{15}{c}$ $c = 16.99$

9.1 – 50 Points

2 dec places

HOT AIR BALLOON You are standing 50 meters from a hot air balloon that is preparing to take off. The angle of elevation to the top of the balloon is 28°. Find the height of the balloon.

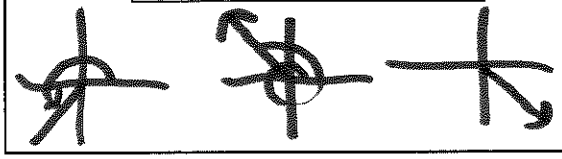
$\tan 28° = \frac{x}{50}$

$x = 26.59$ m

9.2 – 10 Points

Draw an angle with the given measure in standard position.

a. 240° b. 500° c. −50°



9.2 – 20 Points

Find one positive angle and one negative angle that are coterminal with (a) −45° and (b) 395°.

−45° 395°

pos 315° 35°

neg −405° −325°

9.2 – 30 Points

Convert (a) 125° to radians and (b) $-\frac{\pi}{12}$ radians to degrees.

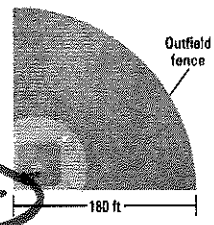
$125 \cdot \frac{\pi}{180}$ $-\frac{\pi}{12} \cdot \frac{180}{\pi}$

$\frac{25\pi}{36}$ $-15°$

9.2 – 40 Points

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

SOFTBALL A softball field forms a sector with the dimensions shown. Find the length of the outfield fence and the area of the field.



$s = 180 \cdot \frac{\pi}{2}$

$s = 90\pi$

$s = 282.74$ ft

$A = \frac{1}{2}(180)^2\left(\frac{\pi}{2}\right)$

$A = 25446.90$ ft^2

* 2 dec places

9.2 – 50 Points

FINDING ARC LENGTH AND AREA Find the arc length and area of a sector with the given radius r and central angle θ.

$r = 15$ cm, $\theta = 45° \cdot \frac{\pi}{180} = \frac{\pi}{4}$

$s = 15\left(\frac{\pi}{4}\right)$

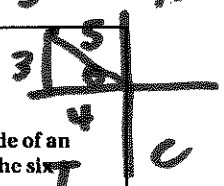
$s = 11.78$ cm

$A = \frac{1}{2}(15)^2\left(\frac{\pi}{4}\right)$

$A = 88.36$ cm^2

9.3 – 10 Points

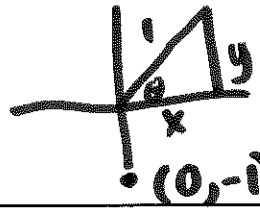
Let (−4, 3) be a point on the terminal side of an angle θ in standard position. Evaluate the six trigonometric functions of θ.



$\sin\theta = \frac{3}{5}$ $\csc\theta = \frac{5}{3}$

$\cos\theta = \frac{4}{5}$ $\sec\theta = \frac{5}{4}$

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



x=0
y=-1
r=1

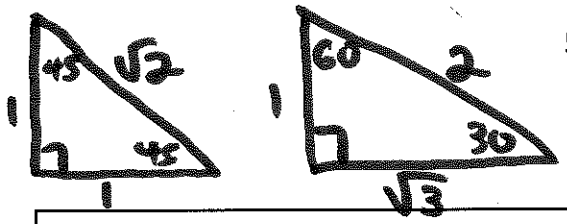
9.3 – 20 Points

Use the unit circle to evaluate the six trigonometric functions of $\theta = 270°$.

$\sin\theta = \frac{-1}{1} = -1$ $\csc\theta = -1$

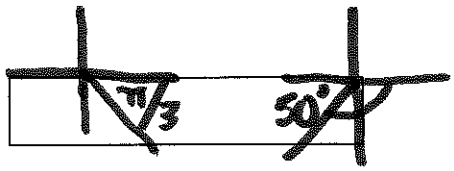
$\cos\theta = \frac{0}{1} = 0$ $\sec\theta = \text{und}$

$\tan\theta = \frac{-1}{0} = \text{und}$ $\cot\theta = 0$



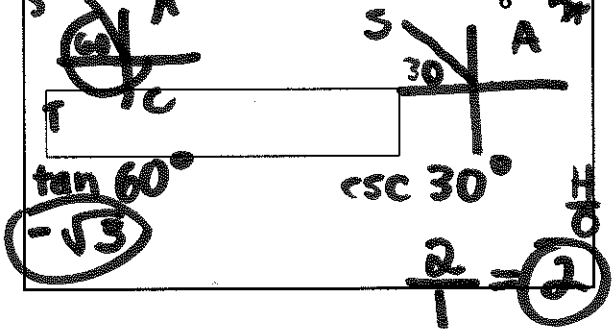
9.3 – 30 Points

Find the reference angle θ' for (a) $\theta = \frac{5\pi}{3}$ and (b) $\theta = -130°$.



9.3 – 40 Points

Evaluate (a) $\tan(-240°)$ and (b) $\csc\frac{17\pi}{6}$.



9.3 – 50 Points

ROBOTICS The "frogbot" is a robot designed for exploring rough terrain on other planets. It can jump at a 45° angle and with an initial speed of 16 feet per second. On Earth, the horizontal distance d (in feet) traveled by a projectile launched at an angle θ and with an initial speed v (in feet per second) is given by:


Frogbot

$$d = \frac{v^2}{32}\sin 2\theta$$

How far can the frogbot jump on Earth?

$d = \frac{16^2}{32}\sin(2\cdot 45°)$

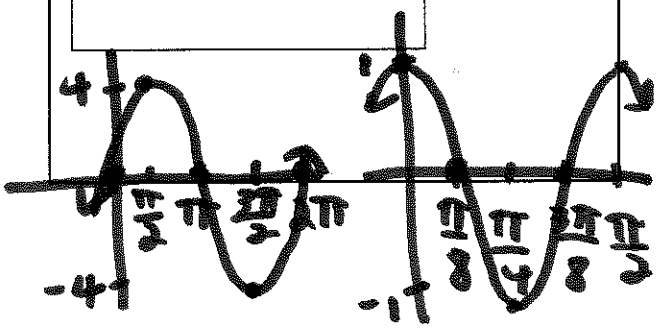
8 ft

10.1 – 10 Points

$\frac{2\pi}{4}$ $\frac{\pi}{2}$

Graph (a) $y = 4\sin x$ and (b) $y = \cos 4x$.

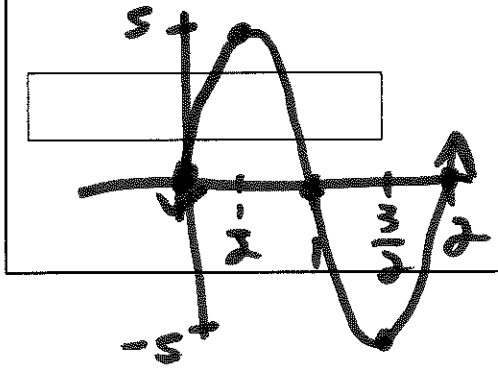
y=4sinx y=cos 4x



10.1 – 20 Points

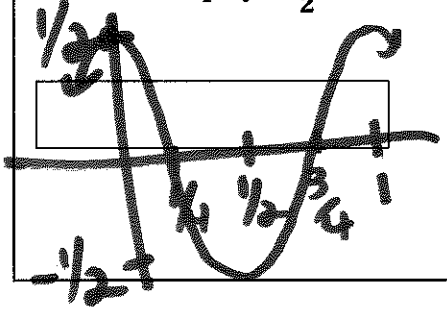
$\frac{2\pi}{\pi}$

Graph $g(x) = 5\sin \pi x$



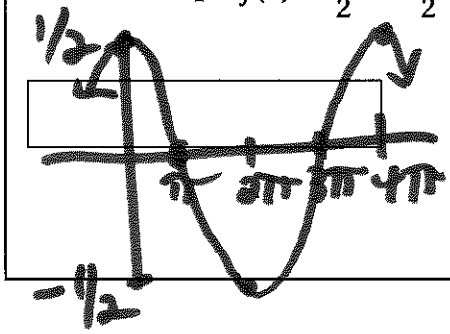
10.1 – 30 Points

Graph $y = \frac{1}{2}\cos 2\pi x$.



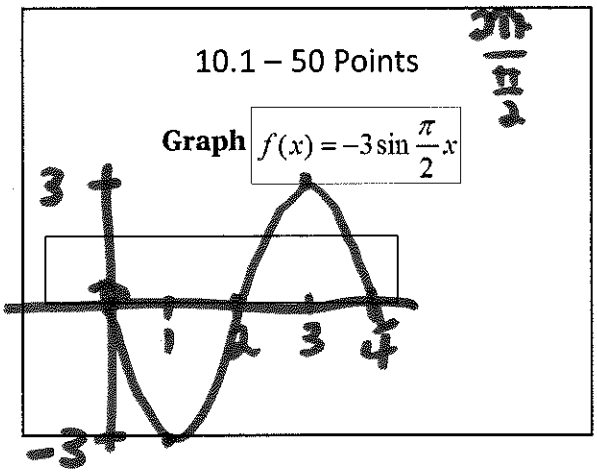
10.1 – 40 Points

Graph $f(x) = \frac{1}{2}\cos\frac{4x}{2}$



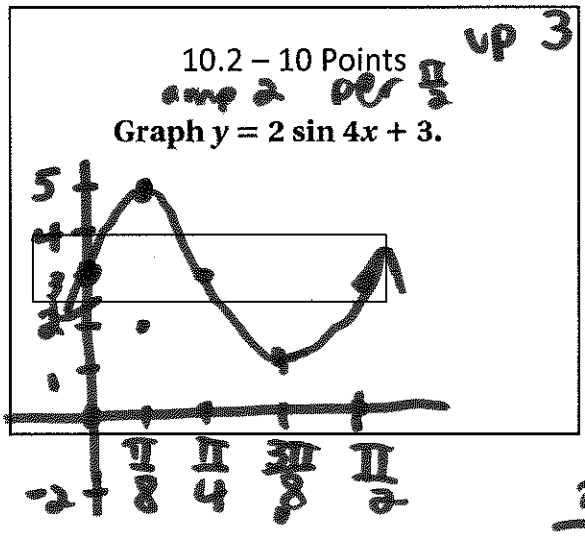
10.1 – 50 Points

Graph $f(x) = -3\sin\frac{\pi}{2}x$



10.2 – 10 Points

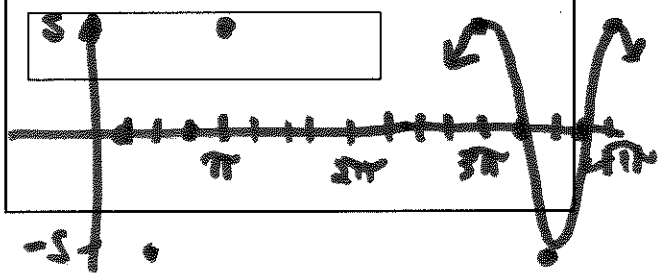
Graph $y = 2\sin 4x + 3$.



R 3π amp 5 per π

10.2 – 20 Points

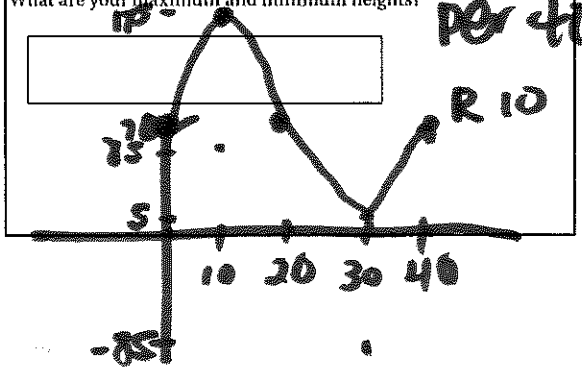
Graph $y = 5\cos 2(x - 3\pi)$.



10.2 – 30 Points

FERRIS WHEEL Suppose you are riding a Ferris wheel that turns for 180 seconds. Your height h (in feet) above the ground at any time t (in seconds) can be modeled by the equation $h = 85\sin\frac{\pi}{20}(t - 10) + 90$.

What are your maximum and minimum heights?



~~HT. $\frac{3}{2}$~~

reflect R $\frac{2\pi}{3}$

amp 2 per 3π

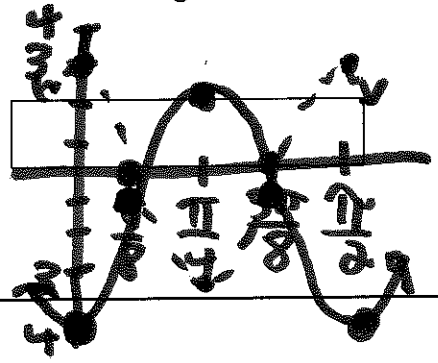
amp 3 per $\frac{\pi}{2}$ reflect D 1

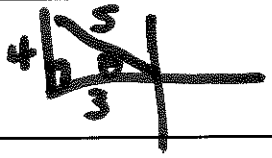
10.2 – 40 Points

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

10.2 – 50 Points

Graph $g(x) = -1 - 3 \cos 4x$





10.3 – 10 Points

Given that $\sin\theta = \frac{4}{5}$ **and** $\frac{\pi}{2} < \theta < \pi$, **find the values of the other five trigonometric functions of** θ.

$\sin\theta = \frac{+4}{5}$ $\quad \csc\theta = \frac{+5}{4}$

$\cos\theta = \frac{-3}{5}$ $\quad \sec\theta = \frac{-5}{3}$

$\tan\theta = \frac{+4}{-3}$ $\quad \cot\theta = \frac{-3}{4}$

$\sin = \frac{y}{1}$

$\cos = \frac{x}{1}$

$\tan = \frac{y}{x}$

$\tan = \frac{\sin}{\cos}$

$\cot = \frac{\cos}{\sin}$

10.3 – 20 Points

Simplify the expression $\sin x \csc x$

$\sin x \cdot \frac{1}{\sin x}$

1

10.3 – 30 Points

Simplify the expression $\csc x \sin x + \cot^2 x$

$\frac{1}{\sin x} \sin x + \cot^2 x$

$1 + \cot^2 x$

$\csc^2 x$

10.3 – 40 Points

Simplify the expression $\sec x \tan^2 x + \sec x$

$\frac{1}{\cos x} \cdot \frac{\sin^2}{\cos^2} + \frac{1}{\cos x}$

$\frac{1}{\cos x}\left(\frac{\sin^2}{\cos^2} + 1\right)$

$\sec x (\tan^2 x + 1)$

$\sec x (\sec^2 x)$

$\sec^3 x$

$\frac{\cos^2}{\sin^2} + \frac{\sin^2}{\sin^2} = \frac{1}{\sin^2}$

$\cot^2 + 1 = \csc^2$

$\frac{\cos^2}{\cos^2} + \frac{\sin^2}{\cos^2} = \frac{1}{\cos^2}$

$1 + \tan^2 = \sec^2$

10.3 – 50 Points

Simplify the expression $\csc\theta\cot^2\theta + \frac{1}{\sin\theta}$.

$\csc\theta\cot^2\theta + \csc\theta$

$\csc\theta(\cot^2\theta + 1)$

$\csc\theta\csc^2\theta$

$\csc^3\theta$