

In this Summative Assessment, there are 36 points possible. You will need 32 points to get 100%. Your school loop grades will follow the curve below:

Let  $x$  be the points you get in the assessment,  
and  $f(x)$  be the percent in the grade book.

$$f(x) = 100\% \cdot \begin{cases} \frac{x}{32}, & x \leq 32 \\ \left[ 1 + 0.05 \sin\left(\frac{x-32}{4}\right) \pi \right], & x > 32 \end{cases}$$

**All answers must be in its exact value.**

## Rationalization is optional.

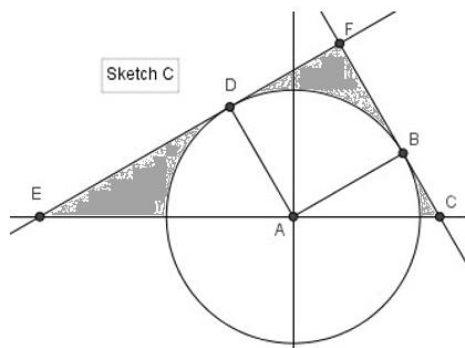
Ex:  $\sqrt{2} \neq 1.41$

$$\pi \neq 3.14$$

1. (8 points)

Form proper responses for questions asked for sketch c.

**The sketches may not be drawn to scale, use the given angle value for calculation**



A is the origin and the radius of circle A is 2 and  $m\angle CAB = 30^\circ$ ,  $m\angle DAE = 60^\circ$ . If  $\overline{CB}$  is a tangent line of circle A passes through B and  $\overline{DE}$  is a tangent line of circle A passes through D, and F is the intersection of these two tangent lines (as shown in the sketch). Find

(1) Coordinates of F

(2) Area with shades between the triangle FEC and the semicircle in the first and second quadrant.

2. (4 points, pick 1)

Find the assigned trigonometric values based on the equation

(a) Find  $\cot \theta$  if  $\frac{3}{2(1-\sin^2 \theta)} = 2 + \tan \theta$

(b) Find  $\csc \theta$  if  $\frac{2 + \cot \theta}{\cot \theta} = \frac{3}{\tan \theta}$

3. (4 points, pick 1)

Graph the given function

➔ For the sine function, identify also the period, amplitude, range, and neutral line and x intercepts.

➔ For the secant function, identify the periods, local minimums, maximums and vertical asymptotes, ranges and x intercepts.

(a)  $f(x) = -2\sin(3x - \pi) + 3$

(b)  $f(x) = 2\sec\left(\frac{\pi}{2}x - \pi\right) - 1$

4. (4 points, pick 1)

Find the trigonometric ratios

(a) Given  $\cot \phi = \frac{\sqrt{2}}{4}$  and  $\phi$  is at the 3<sup>rd</sup> quadrant, find  $\sin \phi$

(b) Given  $\csc \phi = -4$  and  $\phi$  is at the 4<sup>th</sup> quadrant,  
Find  $\cot \phi$

5. (4 points, pick 1)

Verify the following identities:

(a)  $\sec x + \tan x = \frac{\cos x}{1 - \sin x}$

(b)  $\tan^2 x + 1 + \tan x \sec x = \frac{1 + \sin x}{\cos^2 x}$

6. (4 points, pick 1)

Evaluate the expression below:

(a)  $\arcsin\left(-\cos\frac{\pi}{6}\right)$

(b)  $\cos\left(\arcsin\left(\frac{5}{12}\right)\right)$

7. (4 points, pick 1)

Rewrite the following trigonometric expressions to algebraic expressions. All angles in the following expressions are in the first quadrant.

(a)  $\tan(\arccos(x-1))$

(b)  $\sin\left(\arctan\left(\frac{x}{y}\right)\right) + \cos\left(\arctan\left(\frac{y}{x}\right)\right)$

8. (4 points, pick 1)

Solve the following trigonometric equations, if  $x \in [0, 2\pi)$

(a)  $2\sec^2 x - 5\sec x - 3 = 0$

(b)  $4\cos^2(2x) - 1 = 0$