

Place your answers in the spaces provided. You must show correct work to receive credit.

- (8 pts.) 1. Find all the solutions of the equation that are in the interval $[0^\circ, 360^\circ)$. Round the answer(s) to the nearest 0.01° .

$$\csc \theta = -2.15$$

- (8 pts.) 2. Find the exact value of $\sin(2\theta)$ if $\cot \theta = \frac{8}{3}$ and $180^\circ < \theta < 270^\circ$.

- (10 pts.) 3. Find all the solutions of the equation that are in the interval $[0, 2\pi)$.

$$1 + \sin \theta = 2(1 - \sin^2 \theta)$$

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- (16 pts.) 4. If $\tan \theta = \frac{24}{7}$ and $\sin \theta = -\frac{7}{25}$ for a first quadrant angle and a third quadrant angle, find and simplify:

(8 pts.) a) $\sin(\theta + \theta)$

(8 pts.) b) $\cos(\theta - \theta)$

- (12 pts.) 5. Find the exact radian value of the expression whenever it is defined.

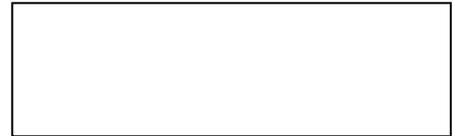
(6 pts.) a) $\sin^{-1} \left(-\frac{1}{2} \right)$

(6 pts.) b) $\tan^{-1}(1)$

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- (10 pts.) 6. Write the expression as an algebraic expression in x for $x > 0$.

$$\cos(\tan^{-1} x)$$



- (12 pts.) 7. Verify the identity:

$$\sin\left(\frac{\pi}{2} + \theta\right) = \cos \theta$$

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- (12 pts.) 8. Solve $\triangle ABC$. Round angle measures to the nearest minute and lengths to one decimal place.

$$= 40^\circ 12', \quad = 31^\circ 42', \quad a = 5.1$$

=	
$b =$	
$c =$	

- (12 pts.) 9. Two automobiles leave Lafayette at the same time and travel along straight highways that differ in direction by 75° . If their speeds are 60 mi./hr. and 40 mi./hr. respectively, how far apart are the cars 1.5 hours after leaving Lafayette? Round your answer to one decimal place. (Draw and label a diagram, set up an equation(s), and solve.)