

- Calculators can be used unless specified otherwise for a given problem.
 - In all problems show your work in the provided exam book. Put a box around your answer and clearly label it.
 - Put your name, your TA's name, your discussion time, and your UIN on the exam booklet.
 - Do not write in the upper right corner of the exam booklet. This is for recording scores.
 - When finished you can keep the exam sheet and turn the exam booklet.
1. Use the **Law of Sines** to solve the SAA Triangle for side **b** only. Do not solve for side c : **$A = 40^\circ$** , **$B = 60^\circ$** , **$a = 4$** . Show all work and give answers rounded to one decimal place.
 2. Use the **Law of Cosines** to solve the SSS Triangle for **$x = \cos(A)$** . Do not find angle A , just find the number x . Assume standard triangle notation for angles A, B, C and sides a, b, c : **$a = 4$** , **$b = 3$** , **$c = 6$** . Show all work and give answer rounded to two decimal places.
 3. Given **$\theta = \tan^{-1}(\frac{1}{2})$** find **$\sin \theta$** . Give the exact answer, show your work and do not use a calculator. Hint, draw a right triangle and find the lengths of all sides.
 4. Simplify: $\frac{\sin(2\theta)}{1-\cos(2\theta)}$. Show all steps. Note the *minus* sign.
 5. Find the exact value of **$\tan(\frac{5\pi}{6})$** . Show your work and do not use a calculator.
 6. Find all the exact solutions to: **$2 \sin(4\theta) = \sqrt{3}$** . Show your work and do not use a calculator.
 7. Find the exact value of: **$\arctan(\tan \frac{5\pi}{4})$** . Give the exact answer, show your work and do not use a calculator. Hint, first find **$\tan \frac{5\pi}{4}$**
 8. Find all solutions to the following equation on the interval **$[0, 2\pi)$**
 $\sin \theta \cdot \cos \theta - \frac{1}{2} \cos \theta = 0$. Give the exact answer, show your work and do not use a calculator.