

MT-A141-04 Make-Up Exam Three Fall 2003

You may keep this page of questions. Turn in your answers with all of your work on the tan paper and green paper. You are **NOT** allowed to use your calculator on questions #1 – 4. Work these questions on the tan paper. After you have finished these first four questions, turn in the first part of the exam and receive green paper to use for the last three questions.

(1) 20 Points. If β is an angle with $3\pi/2 < \beta < 2\pi$ and $\sin \beta = -\frac{2}{3}$, find exact values for the following:

(a) $\cos \beta$ (b) $\cos 2\beta$ (c) $\sin(\beta + \frac{3\pi}{4})$ (d) $\cos(\frac{1}{2}\beta)$

(e) $\cos\left(\frac{\pi}{3} + \arcsin\left(-\frac{3}{7}\right)\right)$.

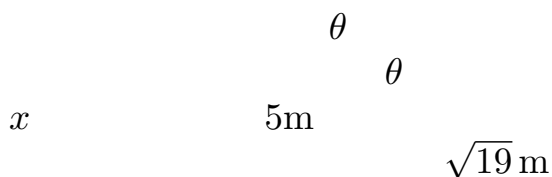
(2) 12 Points. Express $\sin(3\theta)\sin(5\theta)$ as a sum or difference.

(3) 16 Points. Use basic trigonometric identities and algebra to verify that

$$\sec(\Phi) - \tan(\Phi) = \frac{\cos(\Phi)}{1 + \sin(\Phi)} \quad \text{is an identity.}$$

Your proof needs to be **logically** correct as well as algebraically correct and trigonometrically correct.

(4) 12 Points. Find the exact value of x in the figure below. [Hint: The homework problem like this was at the end of the section on double angle and half angle identities.]



Turn in your work and answers for the first four questions and any remaining tan paper before continuing.

(5) 12 Points. Use your calculator to approximate the radian values for the following. Round appropriately.

(a) $\sin^{-1}(-0.53379)$ (b) $\sec^{-1}(3.84)$

(6) 12 Points. Approximate, to the nearest thousandth of a radian, all solutions of the trigonometric equation $4\sin^2 x + 8\sin x = 3$ with $5 \leq x \leq 15$.

(7) 18 Points. Solve triangle ABC if $a = 3.701$ feet, $c = 4.543$ feet and $\alpha = 38.19^\circ$. Show how you calculated the missing values and round your **final** answers appropriately.