

You may keep this page of questions. Turn in your answers with all of your work on the blue paper and orange paper. You are **NOT** allowed to use calculators on questions #1 – 5. Work these questions on the blue paper. After you have finished these first five questions, turn in the first part of the exam and receive orange paper to use for the last two questions.

(1) 20 Points. If β is an angle with $\pi/2 < \beta < \pi$ and $\cos \beta = -\frac{4}{5}$, find exact values for the following:

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

(e) $\sin\left(\frac{\pi}{6} + \arcsin\left(\frac{-1}{\sqrt{5}}\right)\right)$

(2) 12 Points. Express $\cos(9t) - \cos(5t)$ as a product.

(3) 12 Points. Simplify $\frac{\sec^2 \alpha}{1 + \cot^2 \alpha}$

(4) 16 Points. Find exact values, in radians, for all solutions of the equation: $\sin(6x) = -1/\sqrt{2}$.

(5) 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.]

Sorry. After several years, the pdf file that I saved for this exam, apparently had been corrupted and the technology for creating the figure is no longer available. See homework exercises 103 and 104 on page 595 of the third edition of the textbook.

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

(6) 10 Points. Use your calculator to approximate the radian values for the following. Round appropriately.

(a) $\cos^{-1}(-0.7884)$ (b) $\csc^{-1}(2.1007)$

(7) 18 Points. Solve triangle ABC if $a = 729.8\text{m}$, $b = 407.3\text{m}$ and $c = 365.5\text{m}$. Show how you calculated α, β and γ . Find values for α, β and γ to the nearest hundredth of a degree.