

Name _____ Banner: _____

Write your name and Banner here and here.

Instructions for Students using ParSCORE Test Forms

Required Materials (available at campus bookstore):

- ParSCORE Test Form – No. X-101864
- #2 Pencil

Use a #2 Pencil
Note: Marks made with mechanical, recycled, green, and earth friendly pencils as well as pens **will be marked wrong** by the scanner.

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Fill in the entire rectangle to mark your answer. Example answers 1 and 6 will be graded as correct.

Your ID number is the **LAST 8 digits of your BANNER ID**. Drop the first zero on your Banner ID. Example: Student's Banner ID reads "012345678". The ID Number entered on the ParSCORE Test Form is "12345678". *Do not use social security or driver's license number.*

IF YOUR PROFESSOR GIVES MULTIPLE VERSIONS OF THE EXAM, **YOU MUST MARK WHICH VERSION YOU ARE TAKING** UNDER TEST FORM. **IF THERE IS ONLY ONE VERSION OF THE EXAM, YOU MUST MARK "A" UNDER TEST FORM.**

Do not fill in the Exam Number

PRINT your **Name, Course, and Section Number** clearly.

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Do Not mark answers with single line, forget to erase errors completely or forget to fill in answers. Example answers 2-5 will be graded as incorrect.

MWF	10:00 AM	→	1093.002
TTH	8:00 AM	→	1093.005
TTH	2:00 PM	→	1093.008

Separate the pages of the exam and use the back of the paper as scratch paper. I'll have a stapler to staple your exam back together. Grades will be available in WebCT as soon as possible.

Cover your work and your Parscore. Don't talk or look around the room like an idiot. If something is illegible then please notify me. If a question is ambiguous then please ask me to clarify.

DON'T GIVE UP! Do your best on every problem. You are not supposed to already know the answer, you are to figure it out using what you know. Use all of your available time. If you finish early, redo the problems to verify correctness. Don't "check your work"; redo it separately without looking at your previous work.

1. Find $2\cos(15^\circ)$ without using the double angle identity.

- A) $\frac{\sqrt{6} + \sqrt{2}}{2}$ B) $\frac{\sqrt{6} + \sqrt{2}}{4}$ C) $\frac{\sqrt{6} - \sqrt{2}}{4}$ D) $\sqrt{2 + \sqrt{3}}$ E) NONE OF THE ABOVE
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2. Find $\cos(7.5^\circ)$ and $\sin(\pi/24)$

A) $\cos(7.5^\circ) = \sqrt{\frac{2 + \sqrt{6} + \sqrt{2}}{2}}$ and $\sin(\pi/24) = \sqrt{\frac{2 - \sqrt{6} - \sqrt{2}}{2}}$

B) $\cos(7.5^\circ) = \sqrt{\frac{4 + \sqrt{6} + \sqrt{2}}{8}}$ and $\sin(\pi/24) = \sqrt{\frac{4 - \sqrt{6} - \sqrt{2}}{8}}$

C) $\cos(7.5^\circ) = \sqrt{\frac{2 - \sqrt{3}}{4}}$ and $\sin(\pi/24) = \sqrt{\frac{2 + \sqrt{3}}{4}}$

D) $\cos(7.5^\circ) = \sqrt{\frac{2 + \sqrt{3}}{2}}$ and $\sin(\pi/24) = \sqrt{\frac{2 - \sqrt{3}}{2}}$

E) NONE OF THE ABOVE

3. If $\tan(4\theta) = 2/3$ and $4\theta \in [\pi, 3\pi/2)$, find $\cos(2\theta)$

A) $-\sqrt{\frac{1 - \sqrt{3}}{2}}$

B) $\sqrt{\frac{1 - 3/\sqrt{13}}{2}}$

C) $-\sqrt{\frac{1 - 3/\sqrt{13}}{2}}$

D) $-\frac{\sqrt{3} + 2}{2}$

E) NONE OF THE ABOVE

4. If $\cos\theta = x/r$ and $\sin\theta = y/r$ find $\tan(2\theta)$

A) $\frac{x^2 - y^2}{r^2}$

B) $\frac{2xy}{x^2 - y^2}$

C) $\frac{2xy}{r^2}$

D) $\frac{2y}{x}$

E) NONE OF THE ABOVE

5. Solve for θ : $\sin(2\theta) + \sin(\theta) = 0$

A) $\theta = \pi/4 + 2n\pi, 3\pi/4 + 2n\pi, n\pi, \pi/2 + 2n\pi$

B) $\theta = n\pi/2$

C) $\theta = n\pi/4$

D) $\theta = \pi/4 + n\pi/2$

E) NONE OF THE ABOVE

6. If $\pi = \alpha + \beta + \gamma$ then

A) $\sin \gamma \equiv \sin(\alpha + \beta)$ B) $\cos \gamma \equiv \sin(\alpha + \beta)$ C) $\tan \gamma \equiv \frac{\sin(\alpha - \beta)}{\cos(\alpha + \beta)}$

D) ALL OF THE ABOVE

E) NONE OF THE ABOVE

7. Solve for θ : $\cos^2(3\theta) - \sin^2(3\theta) = 0$

A) $\theta = \pi/4 + n\pi/2, \pi/12 + n\pi/2, 5\pi/12 + n\pi/2$ B) $\theta = 11\pi/12 + n\pi/6$

C) $\theta = \pi/4 + n\pi/6$ D) ALL OF THE ABOVE E) NONE OF THE ABOVE

8. Solve for θ : $a \cos \theta - b \sin \theta = c$ where $a, b,$ and c are positive constants and $a \neq 0$ or $b \neq 0$ and $c \leq \sqrt{a^2 + b^2}$

A) $\theta = \alpha - \sin^{-1}(c/\sqrt{a^2 + b^2}) + 2n\pi$ and $-\alpha + \cos^{-1}(c/\sqrt{a^2 + b^2}) + 2n\pi$

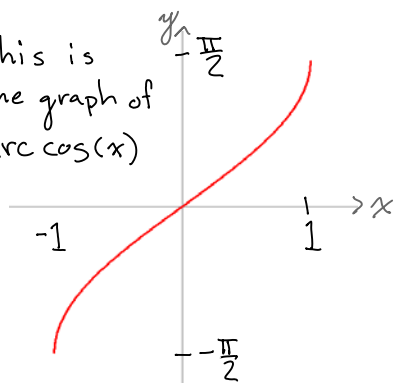
where α satisfies $\cos \alpha = a/\sqrt{a^2 + b^2}$ and $\sin \alpha = b/\sqrt{a^2 + b^2}$

B) $\theta = -\alpha \pm \cos^{-1}(c/\sqrt{a^2 + b^2}) + 2n\pi$ where $\cos \alpha = a/\sqrt{a^2 + b^2}$ and $\sin \alpha = b/\sqrt{a^2 + b^2}$

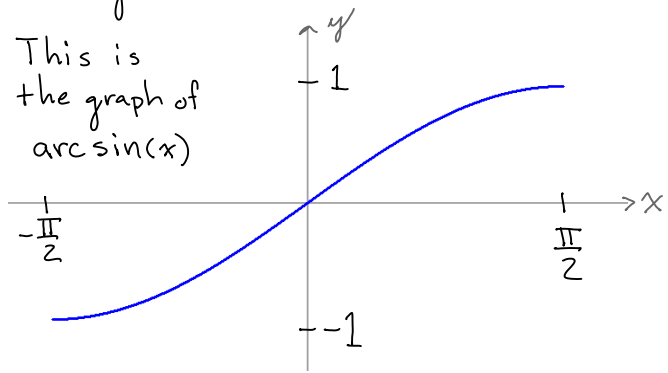
C) $\theta = \pm c/\sqrt{a^2 + b^2}$ D) ALL OF THE ABOVE E) NONE OF THE ABOVE

9. Which of the following is completely true:

A) This is the graph of $\arccos(x)$



B) This is the graph of $\arcsin(x)$



C) $\cos^{-1}[\cos(\cos^{-1}[\cos(5\pi/4)])] = \pi/4$

D) $\sin[\sin^{-1}(\sin[\sin^{-1}(\sqrt{3}/2)])] = \cos(\pi/3)$

E) NONE OF THE ABOVE

10. Which of the following correctly represents the domains and ranges of the specified functions and their inverses.

A) $\mathbb{R} \rightarrow \tan x \rightarrow \mathbb{R} \setminus \{ \pi/2 + n\pi, n \in \mathbb{Z} \} \rightarrow \arctan x \rightarrow (-\pi/2, \pi/2)$

B) $\mathbb{R} \rightarrow \sin(x/2) \rightarrow [-1, 1] ; [-2, 2] \rightarrow \arcsin(x/2) \rightarrow [-\pi, \pi]$

C) $\mathbb{R} \rightarrow \cos(2x) \rightarrow [-1, 1] ; [-1/2, 1/2] \rightarrow \arccos(2x) \rightarrow [0, \pi/2]$

D) $\mathbb{R} \rightarrow \cos^2(x) \rightarrow [0, 1] ; [-1, 1] \rightarrow \arccos^2(x) \rightarrow [0, \pi^2]$

E) NONE OF THE ABOVE