

WRITE ALL YOUR RESPONSES ON YOUR ANSWER SHEETS.

- A) FOR THE **MULTIPLE CHOICE** ITEMS, YOU DO NOT NEED TO SHOW YOUR WORK, **USE ONLY CAPITAL LETTERS** AND YOU DO NOT NEED TO PUT A BOX AROUND YOUR FINAL RESULT.
B) FOR THE **SHORT ANSWER** ITEMS, YOU DO NOT NEED TO SHOW YOUR WORK, AND YOU DO NOT NEED TO PUT A BOX AROUND YOUR FINAL RESULT.

C) FOR THE **FREE RESPONSE** ITEMS, SHOW **ALL** YOUR WORK NEATLY.

USE AS MANY EXTRA SHEETS AS REQUIRED, AND **DRAW A BOX AROUND** YOUR FINAL ANSWER.

D) YOU MAY USE A CALCULATOR, YOUR NOTES, AND THE TEXTBOOK.

YOU MUST SUBMIT PICTURES OF ALL YOUR **ANSWER SHEETS** NO LATER THAN **3:15pm HOUSTON TIME** TODAY. SEND THE PICTURES OF YOUR ANSWER SHEETS AS ATTACHMENTS IN AN EMAIL TO THE ADDRESS:

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NOTE: I WILL BE LESS FORGIVING OF LATE SUBMISSIONS THAN I WAS ON EXAM I.

THERE ARE NINETEEN (19) TOTAL ITEMS ON THE EXAM.

I. MULTIPLE CHOICE: WRITE YOUR RESPONSE IN THE SPACE ON THE ANSWER SHEET. **USE ONLY CAPITAL LETTERS.**

1. FOR THE STATEMENT $\cos(\theta) \tan(\theta) \csc(\theta)$ IF ALL FUNCTIONS ARE EXPRESSED IN TERMS OF $\sin(\theta)$ AND $\cos(\theta)$ THEN SIMPLIFIED, WHAT IS THE RESULT?

- A. 0 B. $\cot^2(\theta)$ C. 1 D. $\cot(\theta)$ E. NONE OF THESE

2. WHAT IS THE CONJUGATE OF THE EXPRESSION $1 - \sin(\theta)$?

- A. $\sin(\theta) - 1$ B. $\cos(\theta) - 1$ C. $1 + \cos(\theta)$ D. IT HAS NO CONJUGATE E. NONE OF THESE

3. FOR WHICH OF THE FOLLOWING ARE **ALL THREE** STATEMENTS TRUE?

A. $\sin^2(\theta) + \cos^2(\theta) = 1$; $\sec^2(\theta) + \csc^2(\theta) = 1$; $\tan^2(\theta) + 1 = \sec^2(\theta)$

B. $\frac{1}{\cot(\theta)} = \frac{\cos(\theta)}{\sin(\theta)}$; $\sin^2(\theta) + \cos^2(\theta) = 1$; $1 + \cot^2(\theta) = \csc^2(\theta)$

C. $\tan^2(\theta) + 1 = \sec^2(\theta)$; $\sin^2(\theta) + \cos^2(\theta) = 1$; $\sec^2(\theta) + \csc^2(\theta) = \tan^2(\theta)$

D. $\sin^2(\theta) + \cos^2(\theta) = 1$; $\cot(\theta) = \frac{\csc(\theta)}{\sec(\theta)}$; $\tan^2(\theta) + 1 = \sec^2(\theta)$

E. NONE OF THESE

4. FOR THE STATEMENT $\sin^2(\theta) \cot(\theta) \csc(\theta)$ IF ALL FUNCTIONS ARE EXPRESSED IN TERMS OF $\sin(\theta)$ AND $\cos(\theta)$ THEN SIMPLIFIED, WHAT IS THE RESULT?

- A. $\cos(\theta)$ B. $\sin^2(\theta)$ C. $\sin^2(\theta) \cos(\theta)$ D. 1 E. NONE OF THESE

5. IN $\triangle ABC$, GIVEN THE FOLLOWING INFORMATION: $a = 40m$, $b = 30m$, $\angle C = 19^\circ$ WHAT IS THE LENGTH OF SIDE c ? (ROUND YOUR ANSWER TO **TWO DECIMAL PLACES**.)
 A. $c = 230.76m$ B. $c = 15.19m$ C. $c = 1718.64m$ D. $c = 41.46m$
 E. NONE OF THESE
6. WHICH OF THE FOLLOWING STATEMENTS IS TRUE **IF AND ONLY IF** $\triangle ABC$ IS A **RIGHT TRIANGLE**?
 A. ALL OF B, C, AND D ARE CORRECT B. $a^2 + b^2 = c^2$ C. $\frac{\sin(A)}{a} = \frac{\sin(B)}{b} = \frac{\sin(C)}{c}$
 D. $c^2 = a^2 + b^2 - 2ab \cos(C)$ E. NONE OF THESE
7. FOR THE STATEMENT $\tan(\theta) \sin(\theta) \cot(\theta) \sec(\theta)$ IF ALL FUNCTIONS ARE EXPRESSED IN TERMS OF $\sin(\theta)$ AND $\cos(\theta)$ THEN SIMPLIFIED, WHAT IS THE RESULT?
 A. $\tan(\theta)$ B. $\sin^2(\theta)$ C. $\cos(\theta)$ D. $\cot(\theta)$ E. NONE OF THESE
8. WHICH OF THE FOLLOWING EXPRESSIONS IS EQUAL TO $\sin^2(\theta)$?
 A. $\cos^2(\theta) - 1$ B. $1 + \cos^2(\theta)$ C. $1 - \cos^2(\theta)$ D. $1 - \csc^2(\theta)$ E. NONE OF THESE
9. IN $\triangle ABC$, GIVEN THE FOLLOWING INFORMATION: $\angle A = 75^\circ$, $\angle B = 34^\circ$, $a = 26m$ WHAT IS THE LENGTH OF SIDE c ? (ROUND YOUR ANSWER TO **TWO DECIMAL PLACES**.)
 A. $c = 8.12m$ B. $c = 14.47m$ C. $c = 19.44m$
 D. NOT ENOUGH INFORMATION IS GIVEN E. NONE OF THESE
10. FOR WHICH THREE GIVEN PIECES OF INFORMATION CAN THE TRIANGLE **NOT** BE SOLVED?
 A. $a = 16m$, $b = 20m$, $c = 14m$ B. $\angle A = 24^\circ$, $\angle B = 60^\circ$, $c = 28m$
 C. $\angle A = 44^\circ$, $\angle B = 72^\circ$, $\angle C = 64^\circ$ D. $\angle A = 66^\circ$, $b = 15m$, $c = 10m$
 E. NONE OF THESE
11. FOR THE STATEMENT $\sin(\theta) \cot(\theta) \cos(\theta)$ IF ALL FUNCTIONS ARE EXPRESSED IN TERMS OF $\sin(\theta)$ AND $\cos(\theta)$ THEN SIMPLIFIED, WHAT IS THE RESULT?
 A. $\tan(\theta)$ B. $\sin^2(\theta)$ C. $\cos(\theta)$ D. $\cot(\theta)$ E. NONE OF THESE
12. . IN $\triangle ABC$, GIVEN THE FOLLOWING INFORMATION: $\angle A = 80^\circ$, $\angle B = 52^\circ$, $b = 14m$ WHAT IS THE LENGTH OF SIDE c ? (ROUND YOUR ANSWER TO **ONE DECIMAL PLACE**.)
 A. $c = 15.2m$ B. $c = 13.2m$ C. $c = 10.6m$
 D. NOT ENOUGH INFORMATION IS GIVEN E. NONE OF THESE

II. FREE RESPONSE: FOR EACH OF THE FOLLOWING ITEMS YOU MUST SHOW YOUR WORK NEATLY AND COMPLETELY AS DEMONSTRATED IN THE VIDEO LESSONS. YOU **DO NOT NEED TO SIMPLIFY** YOUR FINAL RESULT IN ANY WAY, HOWEVER,

DRAW A BOX AROUND YOUR FINAL ANSWER.

USE AS MANY EXTRA SHEETS AS NEEDED. YOUR WORK MUST BE NEAT, READABLE, AND USE ONLY METHODS DISCUSSED ON THE VIDEO LESSONS.

IMPORTANT: SOME STUDENTS' WRITING ON EXAM I WAS EITHER SO SMALL OR SO FAINT THAT IT WAS A CHALLENGE FOR ME TO READ. I NEEDED TO ASK TWO PEOPLE TO RE-SUBMIT BECAUSE OF IT. IF THAT HAPPENS ON EXAM II, THERE WILL BE A PENALTY. IF YOU DO NOT SHOW ALL YOUR WORK IN A NEAT AND ORDERLY FASHION, OR IF YOU USE METHODS OTHER THAN THOSE DISCUSSED ON THE VIDEO LESSONS, OR IF YOU DO NOT FOLLOW DIRECTIONS, YOU FORFEIT YOUR CLAIM TO ANY CREDIT.

PART A: WRITE EACH EXPRESSION IN TERMS OF $\sin(\theta)$ AND $\cos(\theta)$. THEN SIMPLIFY THE EXPRESSION. YOUR FINAL RESULT MAY INVOLVE THE FUNCTIONS $\tan(\theta)$, $\csc(\theta)$, ETC., BUT SHOULD HAVE **NO FRACTIONS** IN IT.

13. $\frac{1 + \cot(\theta)}{\cot(\theta)}$ 14. $\frac{\tan(\theta)}{\csc(\theta)} + \cos(\theta)$

PART B: VERIFY EACH IDENTITY USING THE METHODS DISCUSSED AND DEMONSTRATED IN THE VIDEO LESSONS.

15. $\frac{1 + \cot^2(\theta)}{\csc(\theta)} = \csc(\theta)$ 16. $\frac{\sec(\theta) + \tan(\theta)}{\cot(\theta) + \cos(\theta)} = \tan(\theta) \sec(\theta)$

PART C: SOLVE EACH TRIANGLE, USING THE GIVEN INFORMATION. **ROUND ALL YOUR RESULTS TO ONE DECIMAL PLACE.** USE ONLY THE METHODS DISCUSSED AND DEMONSTRATED IN THE VIDEO LESSONS.

17. GIVEN: IN $\triangle ABC$: $c = 80m$, $\angle A = 32^\circ$, $\angle B = 74^\circ$

18. GIVEN: IN $\triangle ABC$: $b = 15m$, $c = 11m$, $\angle A = 132^\circ$

19. GIVEN: IN $\triangle ABC$: $a = 53m$, $b = 40m$, $c = 37m$

AT THE BOTTOM OF THE LAST PAGES OF YOUR ANSWER SHEETS PRINT NEATLY THE FOLLOWING STATEMENT AND SIGN IT:

“On my honor I have neither given nor received improper assistance on this exam.”