

*Instructions: No books or notes allowed. Do not talk to, give or receive help from anyone. Show all of your work. Put a box around your final answer.*

**1** [7 pts] Consider the equation  $\sin x = \frac{\sqrt{3}}{2}$  (where  $x$  is in radians, of course).

(a) Give the two exact  $x$  solutions that lie in the interval  $0 \leq x < 2\pi$ .

Answer:  $x =$  \_\_\_\_\_ and \_\_\_\_\_

(b) Give all  $x$  solutions exactly. You should use an  $n$  in your answer, where  $n = 0, \pm 1, \pm 2, \dots$

Answer:  $x =$

**2** [7 pts] Write down a set of exact formulas for all of the solutions to the equation  $\sin(3x - 1) = 0.77$ . You should use an  $n$  in your formulas, where  $n = 0, \pm 1, \pm 2, \dots$

Answer:  $x =$

**3** [6 pts] Simplify the expression:  $\cos x + \sin x \tan x$

Your answer should be much simpler in an obvious way. You must show your work for credit.

Answer:  $\cos x + \sin x \tan x =$  \_\_\_\_\_