

Calculus 201-007-50 C2

Quiz 12

December 3, 2008

Name: SOLUTIONS  
 Student ID: \_\_\_\_\_

1. (5 marks). Solve for x:

$$\sqrt{x+1} - \sqrt{2x} = 1$$

$$\begin{aligned} \sqrt{x+1} &= 1 + \sqrt{2x} \\ (\sqrt{x+1})^2 &= (1 + \sqrt{2x})^2 \\ x+1 &= (1 + \sqrt{2x})(1 + \sqrt{2x}) \\ x+1 &= 1 + 2\sqrt{2x} + 2x \\ -x &= 2\sqrt{2x} \end{aligned}$$

$$\begin{aligned} (-x)^2 &= (2\sqrt{2x})^2 \\ x^2 &= 4 \cdot 2x \\ x^2 &= 8x \\ x^2 - 8x &= 0 \\ x(x-8) &= 0 \\ x=0, x=8 \end{aligned}$$

CHECK:  $x=0$   
 $\sqrt{0+1} - \sqrt{2(0)} = 1?$   
 $1 = 1$  TRUE.  
 CHECK  $x=8$   
 $\sqrt{8+1} - \sqrt{2(8)} = 1$   
 $\sqrt{9} - \sqrt{16} = 1$   
 $-1 = 1$  FALSE

$\therefore \boxed{x=0}$

2. (5 marks). Solve for x:

$$x^2 - 4x - 3 = 0$$

$a=1, b=-4, c=-3.$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(-3)}}{2(1)} = \frac{4 \pm \sqrt{16+12}}{2}$$

$$= \frac{4 \pm \sqrt{28}}{2} = \frac{4 \pm \sqrt{4 \cdot 7}}{2} = \frac{4 \pm 2\sqrt{7}}{2} = \frac{2(2 \pm \sqrt{7})}{2}$$

$= 2 \pm \sqrt{7}$