

Last Name: SOLUTIONS

First Name: _____

Student ID: _____

Quiz 2 (A)

Question 1. (4 marks) Simplify the following expression:

$$\frac{(x^2+1)^{1/2} - 2x^2(x^2+1)^{-1/2}}{1-x^2} = \frac{(x^2+1)^{1/2} - \frac{2x^2}{(x^2+1)^{1/2}}}{1-x^2}$$

$$= \frac{\frac{(x^2+1) - 2x^2}{(x^2+1)^{1/2}}}{1-x^2} = \frac{-x^2+1}{(x^2+1)^{1/2}} \cdot \frac{1}{1-x^2} = \frac{1}{(x^2+1)^{1/2}}$$

Question 2. (4 marks) Rationalize the numerator:

$$\frac{1+\sqrt{x+2}}{\sqrt{x+2}} \cdot \frac{1-\sqrt{x+2}}{1-\sqrt{x+2}} = \frac{1+\sqrt{x+2}-\sqrt{x+2}-(x+2)}{\sqrt{x+2}(1-\sqrt{x+2})}$$

$$= \frac{-x-1}{\sqrt{x+2}(1-\sqrt{x+2})}$$

Question 3. (2 marks) Factor the following expression:

$$(x-1)^3 - 8 = [(x-1) - 2][(x-1)^2 + (x-1) \cdot 2 + 2^2]$$

$$= (x-3)(x^2 - 2x + 1 + 2x - 2 + 4)$$

$$= (x-3)(x^2 + 3)$$