

NAME: SOLUTIONS

QUIZ 4

Dawson College

Applied Math (201-943-DW S1)

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Question 1. (5 marks)

Solve the following equation.

$$x^2 = 7x - 12$$

$$x^2 - 7x + 12 = 0$$

$$(x-3)(x-4) = 0$$

THEREFORE SOLUTIONS ARE

$$\boxed{\begin{array}{l} x=3 \\ x=4 \end{array}}$$

Question 2. (5 marks)

The equation $x^3 - 64 = 0$ only has one solution.

(a) Find the solution.

(b) PROVE that this equation only has one solution. (HINT: Factor the equation first)

$$(a) \quad x = 4$$

$$(b) \quad x^3 - 64 = 0$$

$$(x-4)(x^2 + 4x + 16) = 0$$

FROM THE FIRST FACTOR $x-4$ WE SEE $x=4$ IS A SOLUTION

THE SECOND FACTOR IS $x^2 + 4x + 16$

THIS IS A QUADRATIC WITH DISCRIMINANT $b^2 - 4ac = 16 - 4(16) = -48$

THIS MEANS $x^2 + 4x + 16 = 0$ HAS NO SOLUTIONS

Therefore $x^3 - 64 = 0$ HAS ONLY ONE SOLUTION

Question 3. (10 marks)

Solve the following equation.

$$\frac{8}{x+1} - \frac{5}{1-x} = \frac{x-3}{x^2-1}$$

$$\frac{8}{x+1} + \frac{5}{x-1} = \frac{x-3}{(x+1)(x-1)}$$

MULTIPLY BOTH SIDES BY $(x+1)(x-1)$ & YOU GET

$$8(x-1) + 5(x+1) = x-3$$

$$8x - 8 + 5x + 5 = x - 3$$

$$12x = -3 - 5 + 8$$

$$12x = 0$$

$$\boxed{x = 0}$$

(CHECKING ORIGINAL EQUATION
WE CONFIRM THAT $x=0$
IS A SOLUTION)

Question 4 (10 marks)

Solve the equation $4x^2 + 20x + 25 = 0$

(a) By factoring

(b) By using the quadratic formula

$$(a) \quad 4x^2 + 20x + 25 = 0$$

$$4x^2 + 10x + 10x + 25 = 0$$

$$2x(2x+5) + 5(2x+5) = 0$$

$$(2x+5)^2 = 0$$

$$2x+5 = 0$$

$$\boxed{x = -\frac{5}{2}}$$

$$(b) \quad x = \frac{-20 \pm \sqrt{20^2 - 4(4)(25)}}{2(4)} = \frac{-20 \pm \sqrt{0}}{8} = -\frac{20}{8} = \boxed{-\frac{5}{2}}$$