

Quiz 0_B

● Graded

Student

Javier Herrera

Total Points

8 / 30 pts

Question 1

Problem 1

4 / 10 pts

+ 2 pts (a) Correct, all work is shown

+ 1.5 pts (a) Partial: almost correct, 1 small computational mistake or a missing step

+ 1 pt (a) Partial: 2 small mistakes, OR some work is missing

+ 2 pts (b) Correct, all work is shown

+ 1.5 pts (b) Partial: Partial: almost correct, 1 small computational mistake or missing steps

+ 1 pt (b) Partial: 2 small mistakes, OR some work is missing

+ 2 pts (c) Correct, all work is shown

+ 1.5 pts (c) Partial: almost correct, 1-2 small computational mistake(s) or missing steps

+ 1 pt (c) Partial: answer is correct, no work shown OR formula applied correctly, no computations

+ 2 pts (d) Correct, all work is shown

+ 1.5 pts (d) Partial: almost correct, 1-2 small computational mistake(s) or missing steps

+ 1 pt (d) Partial: answer is correct, no work shown OR formula applied correctly, no computations

+ 2 pts (e) Correct, all work is shown

+ 1.5 pts (e) Partial: almost correct, 1-2 small computational mistake(s) or missing steps

+ 1 pt (e) Partial: answer is correct, no work shown OR formula applied correctly, no computations

+ 0 pts Incorrect/Not submitted

Question 2

Problem 2

0 / 10 pts

- + 2 pts (a) Correct expression
- + 1 pt (a) Partial: A small mistake in the expression
- + 2 pts (b) Correct expression and justification
- + 1 pt (b) Partial: A small mistake in expression and justification
- + 2 pts (c) Correct expression and justification
- + 1 pt (c) Partial: A small mistake in expression and justification
- + 2 pts (d) Correct expression
- + 1 pt (d) Partial: A small mistake in expression and justification
- + 2 pts (e) Correct expression
- + 1 pt Click here to replace this description.

✓ + 0 pts Incorrect/No solution

Question 3

Problem 3

4 / 10 pts

- ✓ + 1 pt (a) Answered (implied) "False", some justification is present
- ✓ + 2 pts (a) Correct justification
Can be: counterexample $x = -1, -3$

- + 1.5 pts (a) Partial: "False", incomplete justification OR "True", reasonable justification with a small mistake
- ✓ + 1 pt (b) Answered (implied) "True", some justification is present
- + 2 pts (b) Correct justification
- + 1.5 pts (b) Partial justification
- + 0.5 pts (c) Answered (implied) "False", some justification is present
- + 2 pts (c) Correct justification
- + 0.5 pts (d) Answered (implied) "False", some justification is present
- + 2 pts (d) Correct justification
- + 1.5 pts (d) Partial justification
- + 0 pts Incorrect/Not answered

NAME: Javier Herrera

SID: 6602322016

CS111 Quiz 0 (B)

Rules:

Problem 1: (a) Determine the numerical values of the expressions below. To receive credit, you must show your work for each subproblem. Simplify your answer to a single number.

$$3^{\log_9 16} =$$

$$15 \log_3 \frac{1}{81} =$$

$$\binom{20}{18} = \frac{20!}{18! 2!} = \frac{m!}{n!(m-n)!}$$

$$\sum_{i=1}^{40} 3i = 3(1) + 3(2) + \dots + 3(40)$$

$$= 120(12) = \frac{4520}{2} = \boxed{2205}$$

$$\sum_{i=0}^{\infty} \left(\frac{1}{5}\right)^i = \frac{1}{1-\frac{1}{5}} = \frac{1}{\frac{4}{5}} = \boxed{\frac{5}{4}}$$

CS111-E25 QUIZ 9

NAME: Javier Henrique

SID: 001377016

Problem 2: A university is hosting a hackathon with 150 students participating. Answer the following questions. Express your answer using an appropriate numerical expression (for example, $\frac{15!}{5!}$ or 5^{10}). Do not compute the final numerical value. Give a one-sentence justification.

- (a) At the opening of the hackathon, every student greets every other student with a handshake exactly once. How many handshakes occur in total?

$$n(n-1) = 150!$$
$$n(n-1) = 150(149)$$

- (b) The students are asked to line up to receive their hackathon badges. In how many ways can they line up?

$$2^{150}$$

- (c) Each student must decide whether to participate in a coding challenge or a software construction challenge. In how many different ways can the students be divided into these two groups?

$$\frac{n(n+1)}{2} = \frac{150(151)}{2}$$

- (d) There are nine hackathon challenges planned for the day. Five of them should be completed in the morning session, and four in the afternoon session. In how many ways could the challenges be divided between the morning and afternoon sessions? (The order of challenges within each session does not matter.)

- (e) The organizers want to choose three winners of the hackathon for 1st, 2nd, and 3rd place. In how many ways can the winners be selected?

NAME: Xavier Hernan

SID: 62322016

Problem 3: Determine whether the following statements are true or false. Give justification for your answers. (Reminders: \mathbb{R} denotes the set of all real numbers, \mathbb{Z} - the set of all integers, \forall - the universal quantifier, and \exists - the existential quantifier.)

(a) $\forall x \in \mathbb{Z} : x^3 + 3x^2 + 5x + 3 > 0.$

"for every integer x , it is true" This is false since there is an integer that makes the statement untrue, $x = -1$

$$\begin{aligned} &x^3 + 3x^2 + 5x + 3 > 0 \\ &= (-1)^3 + 3(-1)^2 + 5(-1) + 3 > 0 \times 0 \end{aligned}$$

(b) $\forall x \in \mathbb{Z} : 8x^2 - 6x + 1 > 0.$

"for every integer x , it is true"

$$8x^2 - 6x + 1 > 0 \rightarrow 8(3)^2 - 6(3) + 1 > 0$$

det = $b^2 - 4ac$ $72 - 18 + 1 > 0$ This statement is
 $= -6^2 - 4(8)(1)$ $55 > 0$ true since the
 $= 36 - 32 = 4$ det is positive
 $\therefore 36 > 32 = 4$ and a real number

(c) $\forall x \in \mathbb{R}, \exists y \in \mathbb{R} : x^2 - y^2 = 4x.$

"for every real number x , there exists a real number y "

$$\begin{aligned} x^2 - y^2 &= 4x & x \in \mathbb{R} \\ \frac{y^2}{x^2 - 4x} + \frac{y^2}{x^2} &= \frac{4x}{x^2} \\ x - 4 &= y & \sqrt{y^2} = \sqrt{4x} \\ y &= \pm\sqrt{4x} \end{aligned}$$

(d) $\forall x \in \mathbb{R}, \exists y \in \mathbb{R} : y^2 + 2 = 2^{x^2}.$

"for every real number x , there exists a real number y "

$$y^2 + 2 = 2^{x^2}$$

This statement is true since when solving for y , it's a real number

NAME:

SID: