MATH 120: Quantitative Reasoning

Name: KEY

Quiz 3
Fall 2011

Clearly indicate your final answer(s) and follow all instructions. Explain your reasoning where appropriate. Partial credit may be awarded for answers containing only minor mistakes.

During the past football season, the medical teams documented 256 injuries that caused a loss of participation time to the player. The results of the investigation, reported in *The American Journal of Sports Medicine*, is show in the table.

Severity	Practice(P)	Game(G)	Total
Minor (A)	66	88	154
Moderate (B)	23	44	67
Major (C)	12	23	35
Total	101	155	256

Give all answers as fractions in lowest terms, or as decimals rounded to three places.

1. (5 points) If an individual is selected at random from this group of 256 football players, find the probability that the player suffered a major injury given that the injury occurred in practice. (That is, find $P(C \mid P)$.)

$$P(C|P) = \frac{P(C \cap P)}{P(P)} = \frac{12}{101}$$

2. (5 points) If two individuals are selected at random, *without replacement*, from this group of 256 football players, find the probability that both were game related injuries.

$$P(G \cap G) = P(G) \cdot P(G|G) = \frac{155}{256} \cdot \frac{154}{255} = .36566$$

3. (5 points) If an individual is selected at random from this group of 256 football players, find the probability that the player suffered a major injury or the injury occurred in the game. (That is, find $P(C \cup G)$.)

$$P(C \cup G) = P(C) + P(G) - P(C \cap G) = \frac{35}{256} + \frac{155}{256} - \frac{23}{256} = \frac{167}{256}$$

4. (5 points) If two individuals are selected at random, *with replacement*, from this group of 256 football players, find the probability that one player's injury occurred in practice and the other player's injury was minor.

prac minor

$$P(P \cap A) = P(P) \cdot P(A) = \frac{101}{256} \cdot \frac{154}{256} = .23734$$