7   Sam and Tom are playing a game which involves a bag containing 5 white discs and 3 red discs. They take turns to remove one disc from the bag at random. Discs that are removed are not replaced into the bag. The game ends as soon as one player has removed two red discs from the bag. That player wins the game.

Sam removes the first disc.

(a) Find the probability that Tom removes a red disc on his first turn.   [2]

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(b) Find the probability that Tom wins the game on his second turn. [4]

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(c) Find the probability that Sam removes a red disc on his first turn given that Tom wins the game on his second turn. [2]

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