

## Double Dare

Double Dare was an old Nickelodeon game show in which two teams would compete to make the final obstacle course. If a team made it to the obstacle course and completed it, they typically won a trip to space camp. This example focuses on the decision-making surrounding one question of the main round of the game.

During the main round of the game, the host would ask the controlling team a question worth \$100. The team could either attempt to answer the question or 'dare' the opposing team to answer the question. By daring the other team, the value of the question would double to \$200. The dared team would then have the choice to attempt to answer the question or 'double dare' the controlling team. By double daring the controlling team, the value of the question would double again to \$400. At this stage, the controlling team could attempt to answer the question or accept the physical challenge. If a team attempts to answer the question and gets it wrong or fails the physical challenge, then the opposite team would receive an amount equal to the current value of the question.

You are on the controlling team playing Double Dare. You receive a question that you are 60% sure you know the correct answer. Based on the gameplay so far, your opposing team will answer any question that they know the answer to and will not guess if they do not know the answer to the question. You believe that the team has a 40% chance of knowing the current question (and therefore answering correctly). You also believe that you can win the physical challenge (if you eventually choose to accept it) with a probability of 75%. Provide the decision tree for this problem, the expected payoff and selected decision alternatives for each possible state.