

Numerical expressions may be left unsimplified.

1. A student has \$2000 to spend on tuition this semester and she will take courses in Business and Math. Courses in the Business school cost \$200 per credit, and courses in the Math department cost \$150 per credit. She estimates that each credit in Business school boosts her starting salary after graduation by \$1000, while each credit in the math department boosts it by \$800.

How many courses of each type should she take in order to maximize her starting salary?

2. In a penalty shot in soccer the kicker must decide whether to kick to the left or right side of the goalie. At the same time the goalie will guess on which side to expect the ball. The kicker is better when kicking to the right, he scores 70% of the time when kicking to the right if the goalie does not guess correctly, and 50% of the time when the goalie does guess correctly. But when the kicker goes left he scores only 60% of the time when the goalies guesses incorrectly, and only 40% of the time when the goalie does guess correctly.

What are the best strategies for the kicker and the goalie? I.e., what fraction of the time should each go left or right?