

Dyn Models hw10

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1 Introduction

1.1 Question 1

$ExactPD(20, 40, 19/40)$

Probability of winning: 0.1190277811

Expected Duration of game: 304.7777751

$EstPD(20, 40, 19/40, 100)$

Probability of winning: 0.1100000000

Expected Duration of game: 292.0600000

$EstPD(20, 40, 19/40, 1000)$

Probability of winning: 0.1310000000

Expected Duration of game: 308.3000000

$EstPD(20, 40, 19/40, 5000)$

Probability of winning: 0.1190000000

Expected Duration of game: 307.1728000

The value of K which best estimated both the probability of winning and the expected duration of the game was 5000. This is likely because we have a larger sample which tends to lead to results that are more representative of the true distribution (i.e. the Law of Large Numbers)

1.2 Question 2

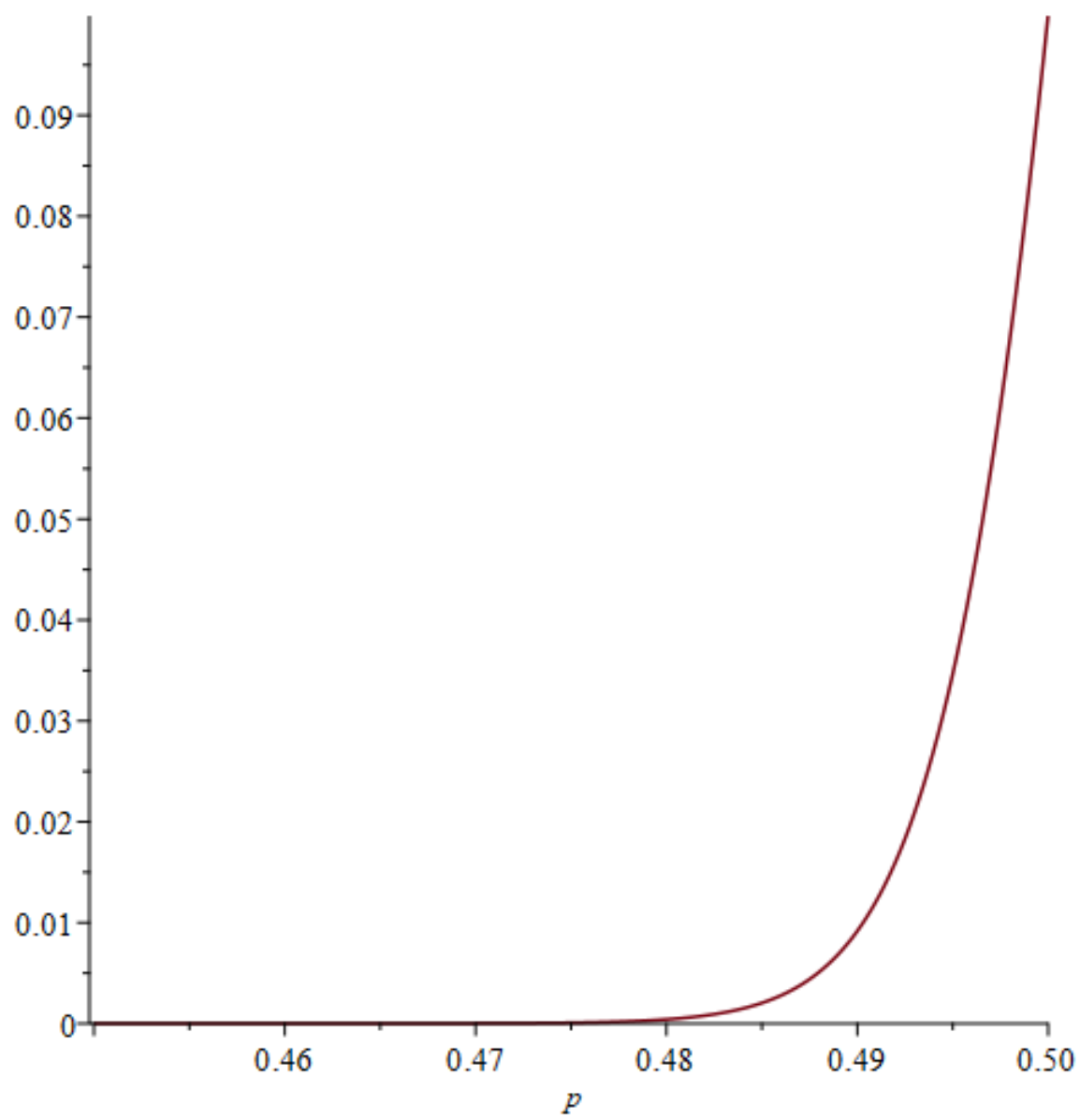


Figure 1: $n=10$

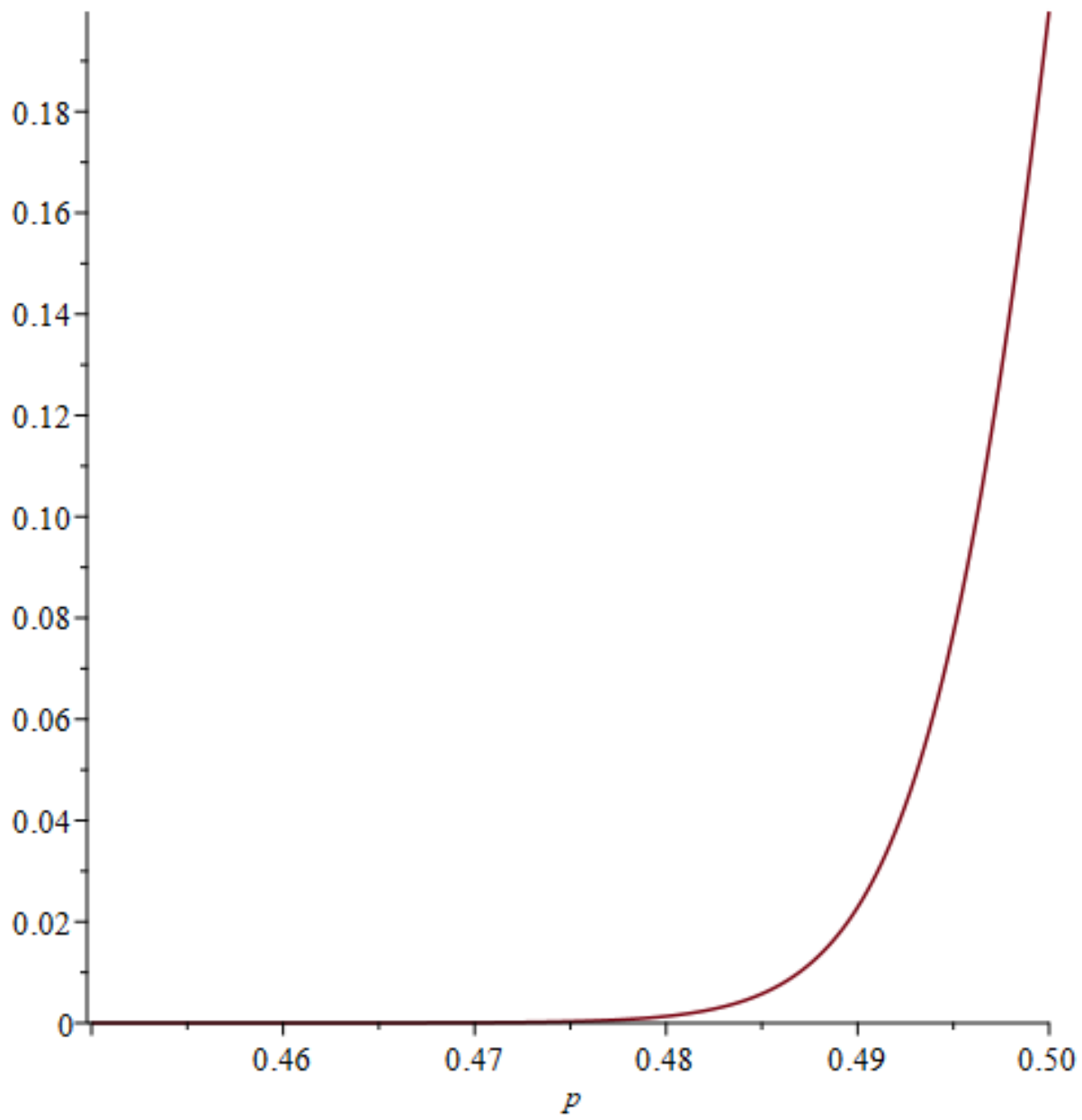


Figure 2: $n=20$

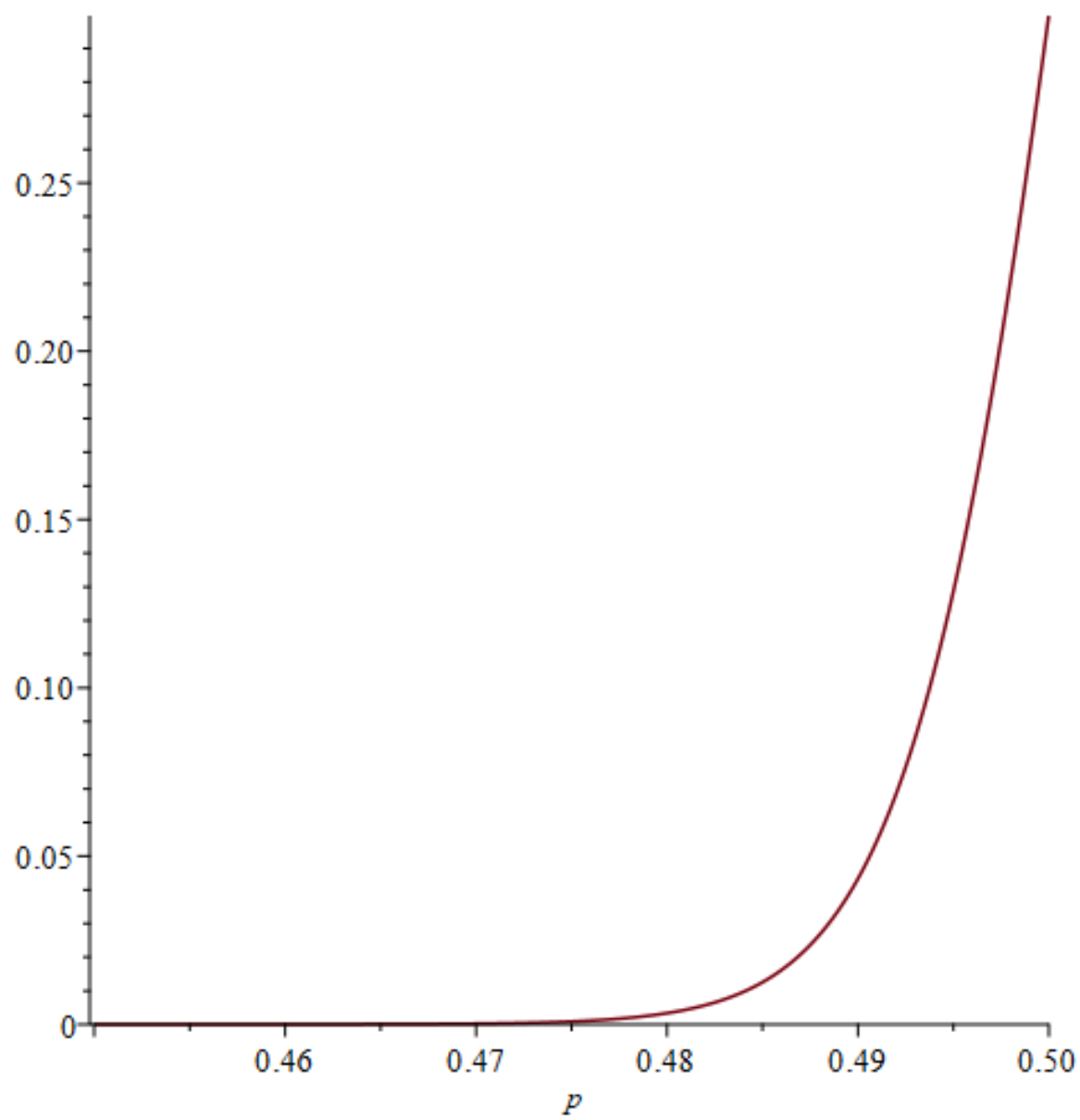


Figure 3: $n=30$

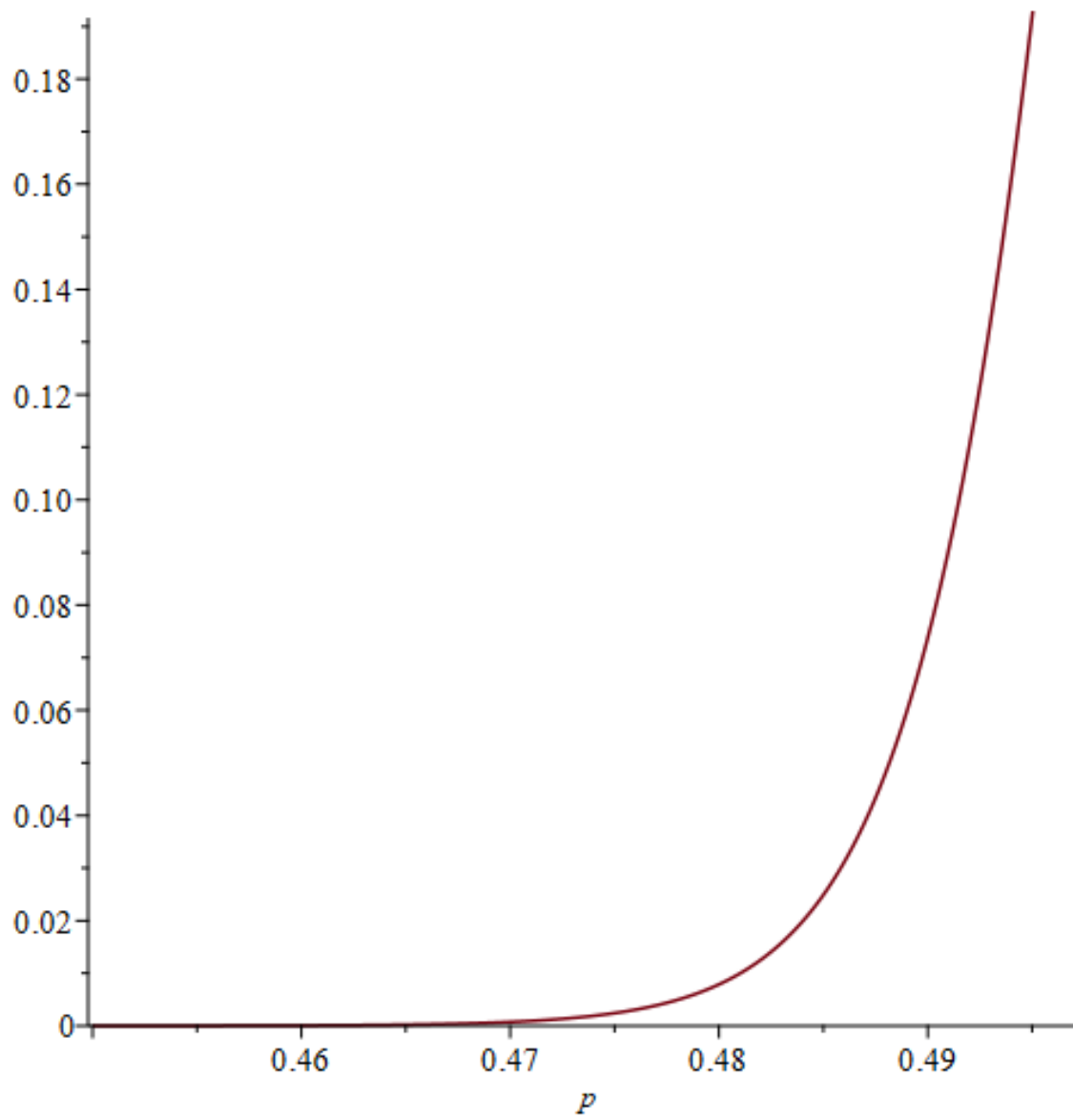


Figure 4: $n=40$

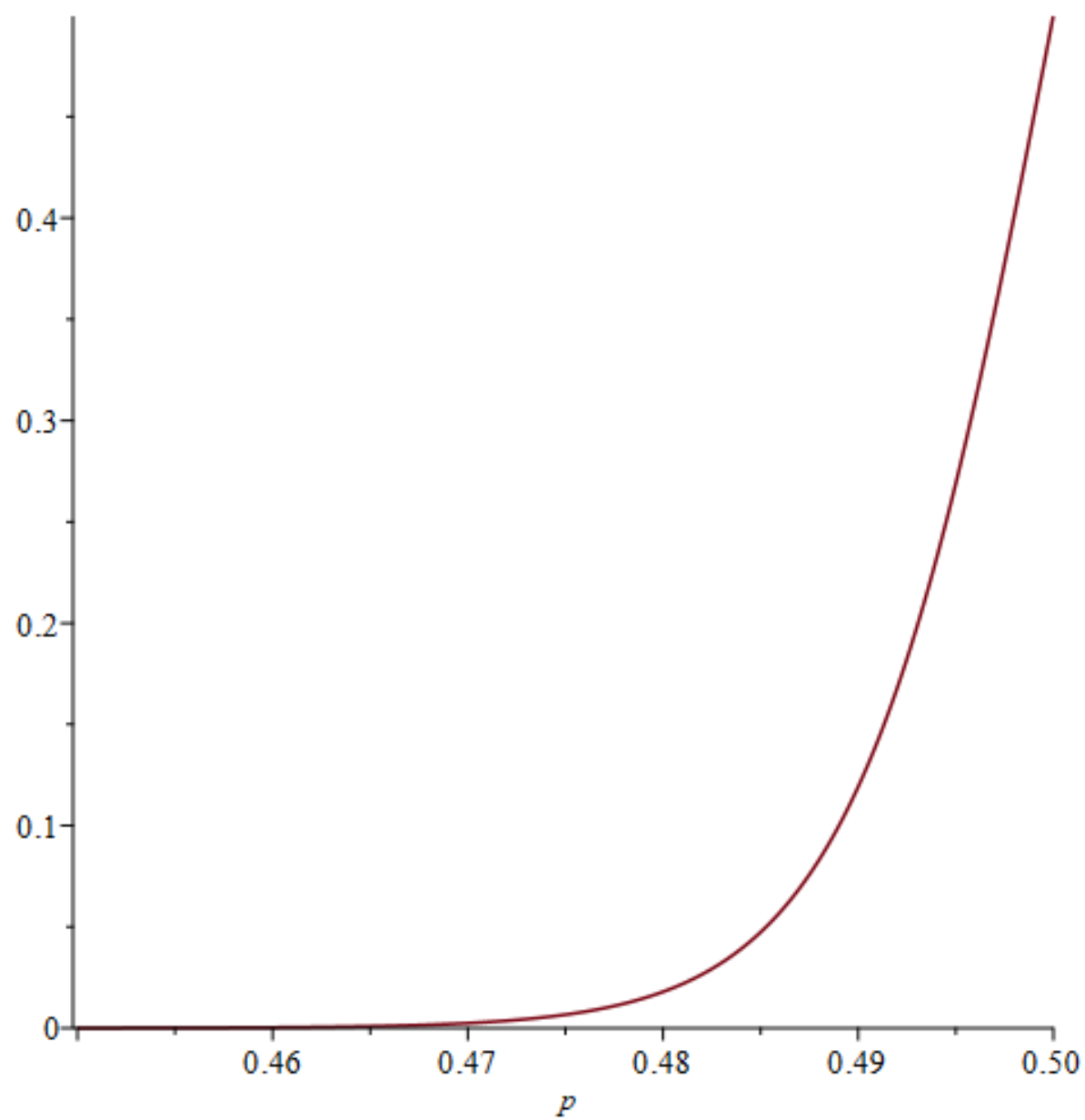


Figure 5: $n=50$

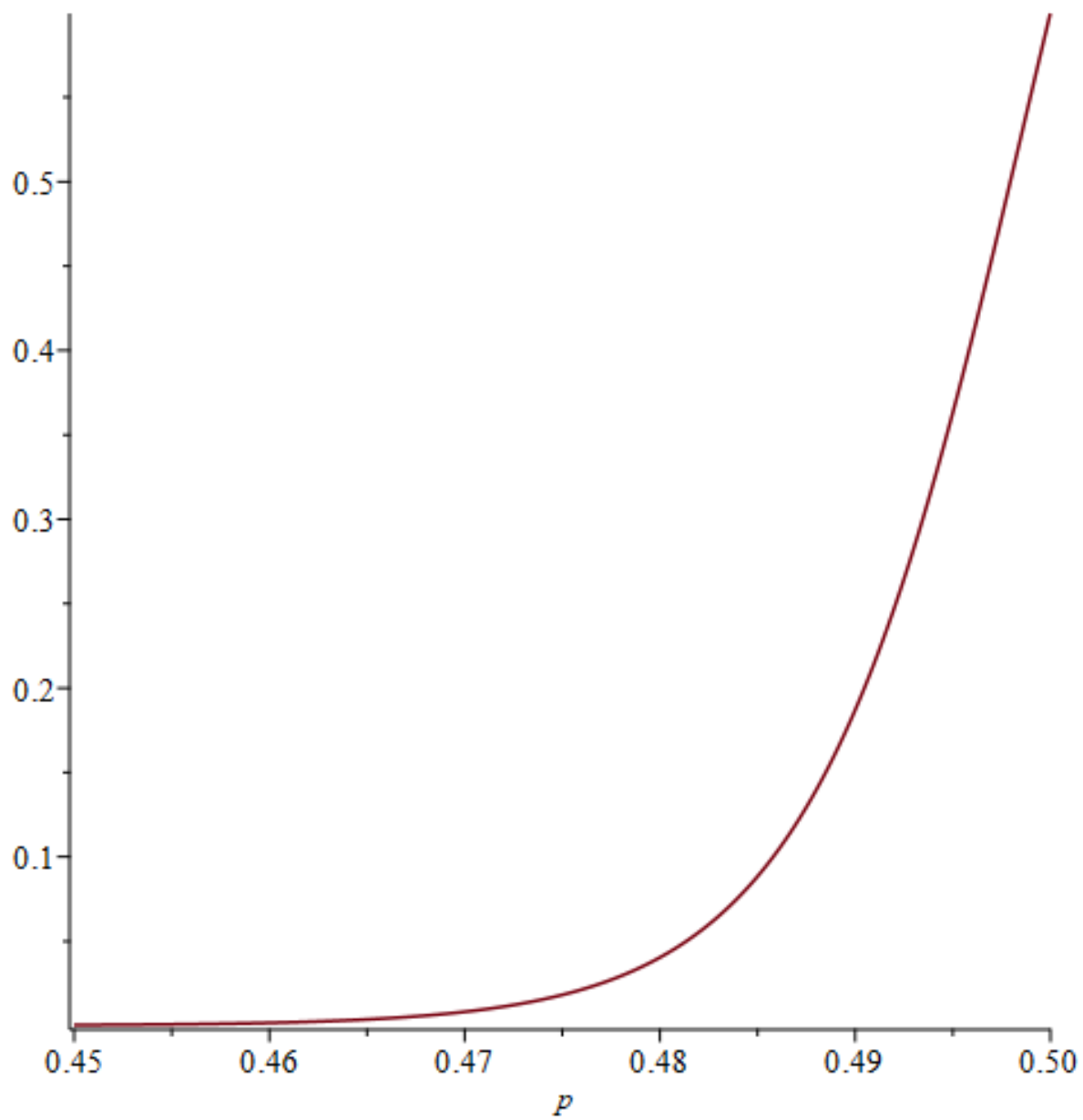


Figure 6: $n=60$

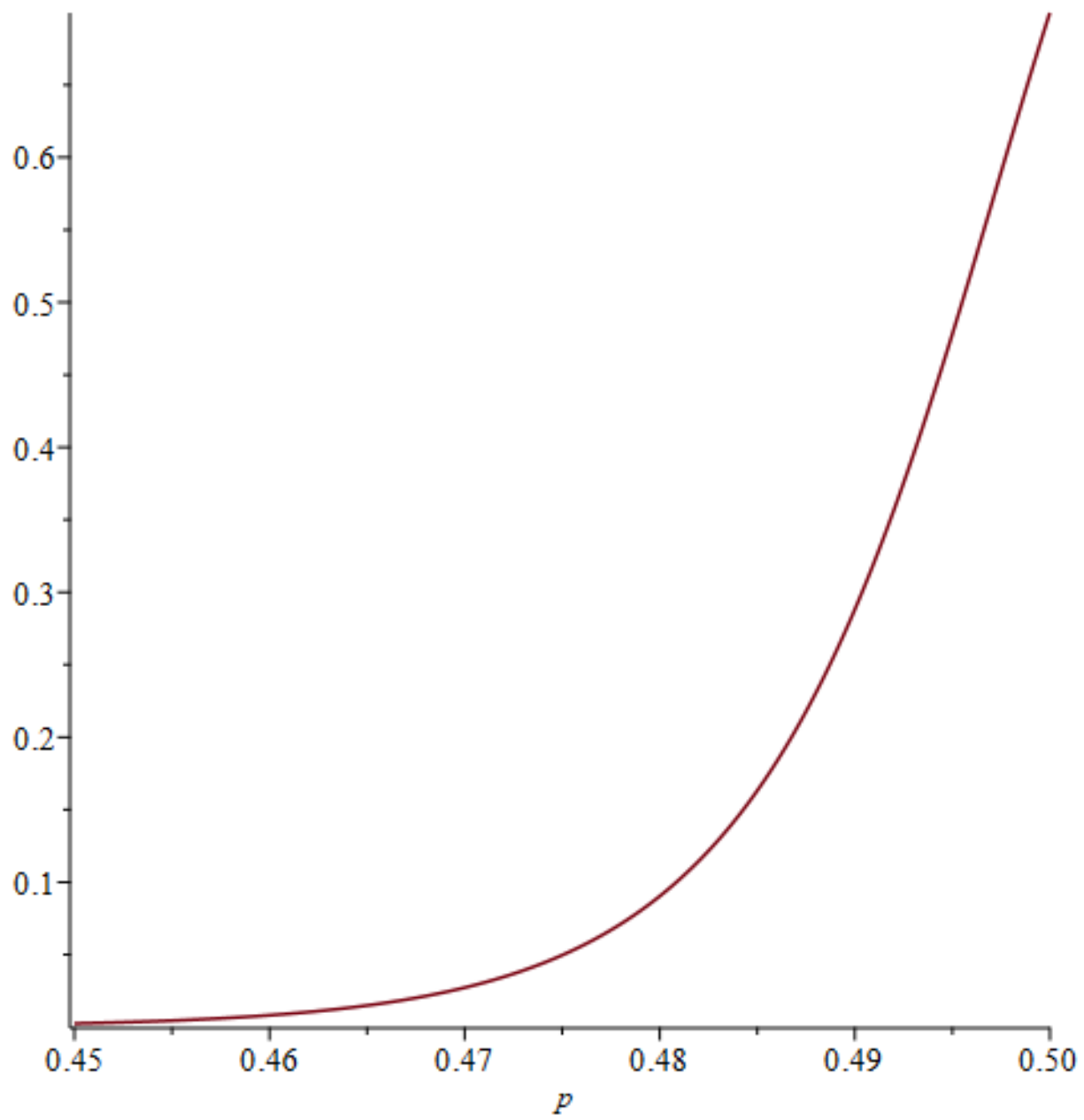


Figure 7: $n=70$

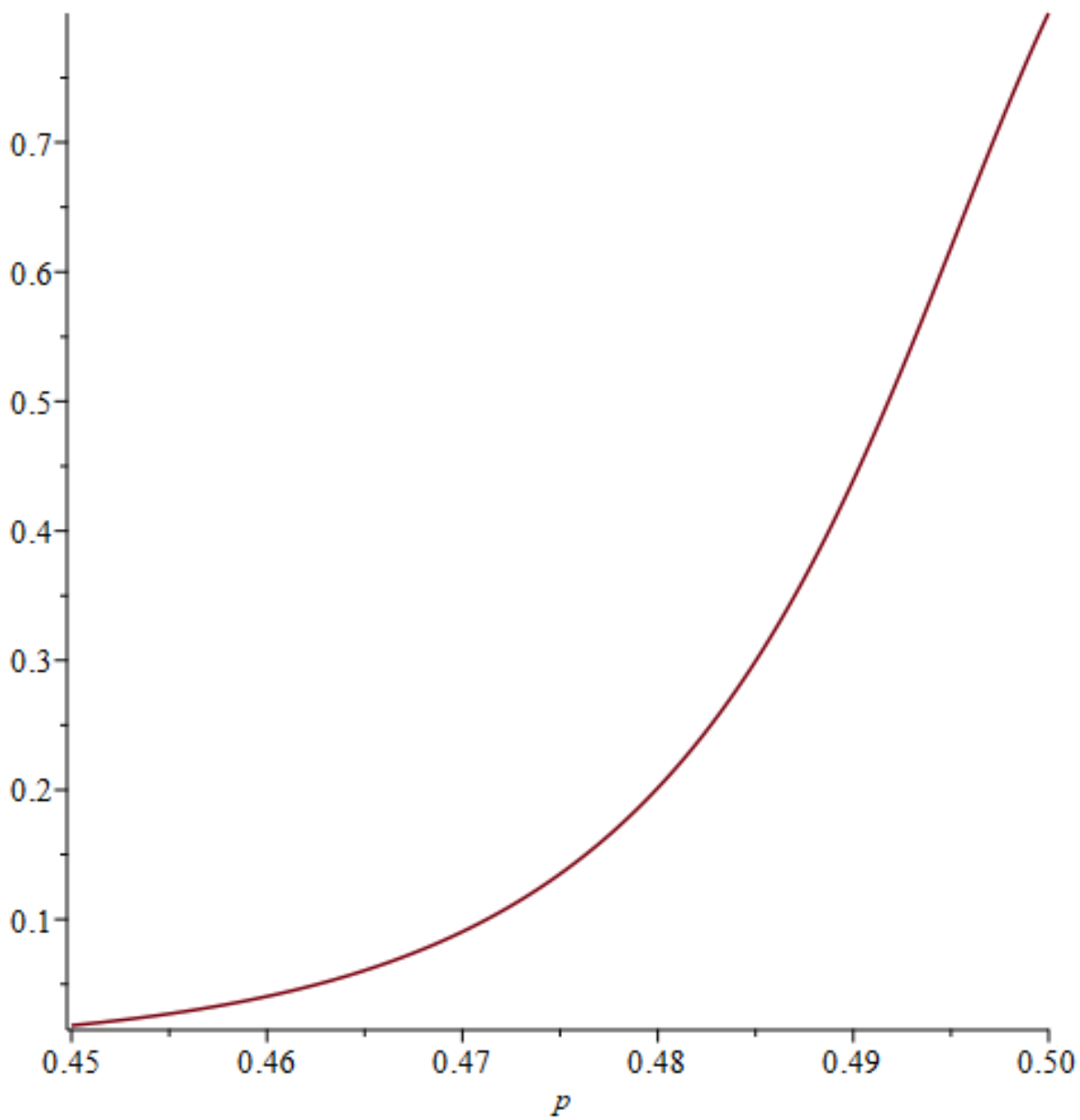


Figure 8: $n=80$

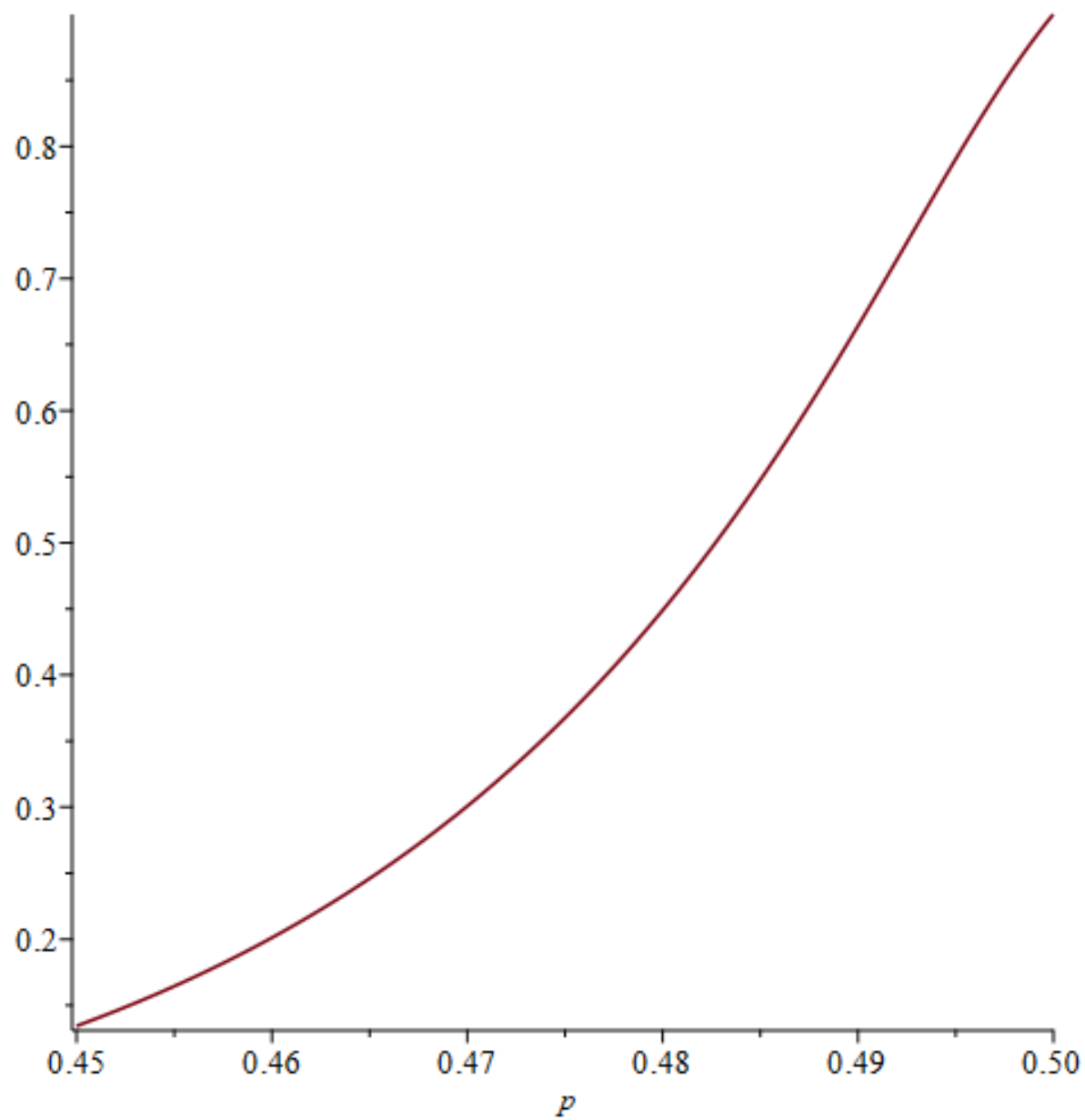


Figure 9: $n=90$