

MIDTERM

Name: _____

ID: _____

Problem 1 (10 P):

A. Enumerate four systems that can be modeled and simulated:

- i. _____
- ii. _____
- iii. _____
- iv. _____

B. System models can be:

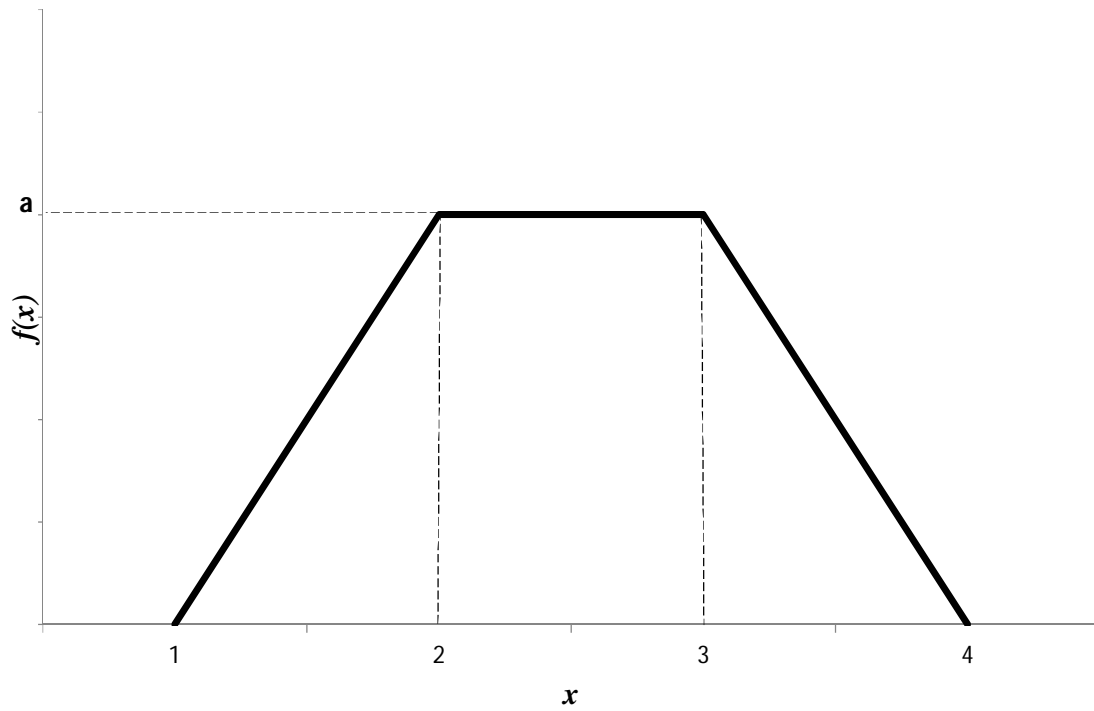
- i. _____ vs. _____
- ii. _____ vs. _____
- iii. _____ vs. _____

C. Based on the categories in part B, the passport service operation can be described as:

D. Describe the difference between capacity and quantity in relation to Arena™ resources:

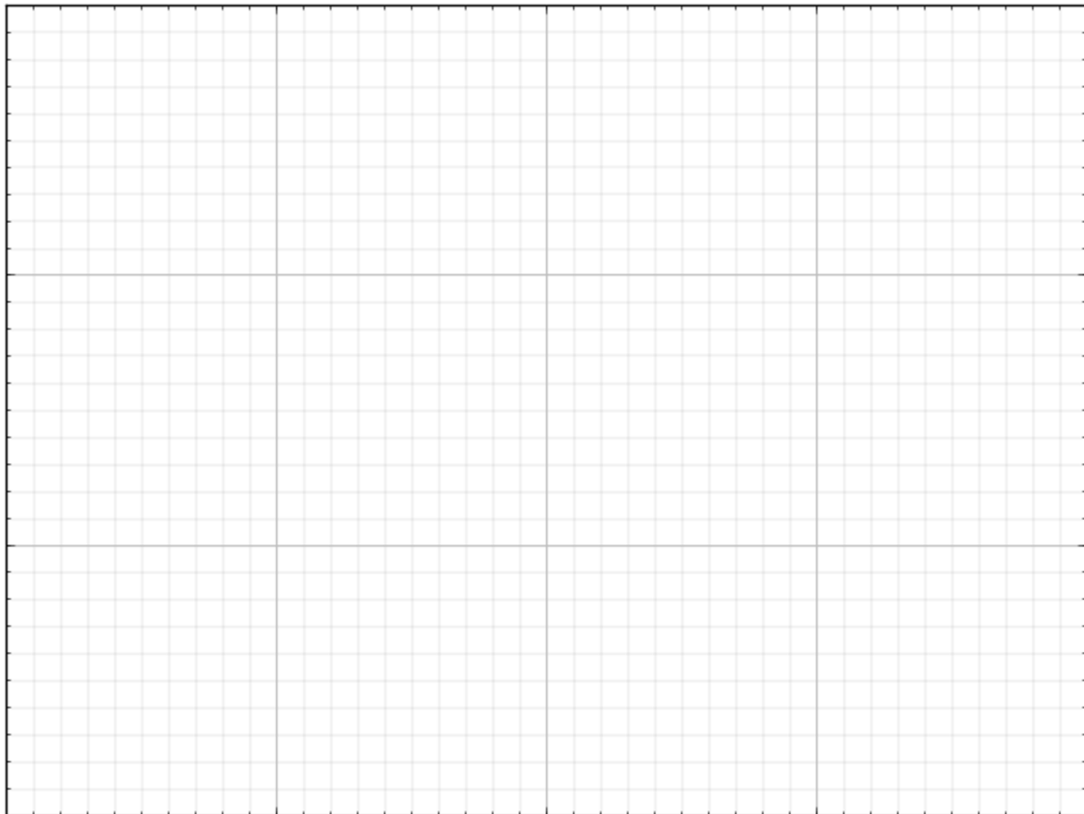
Problem 2 (50 P):

Provided that the demand probability distribution shown in the following figure.

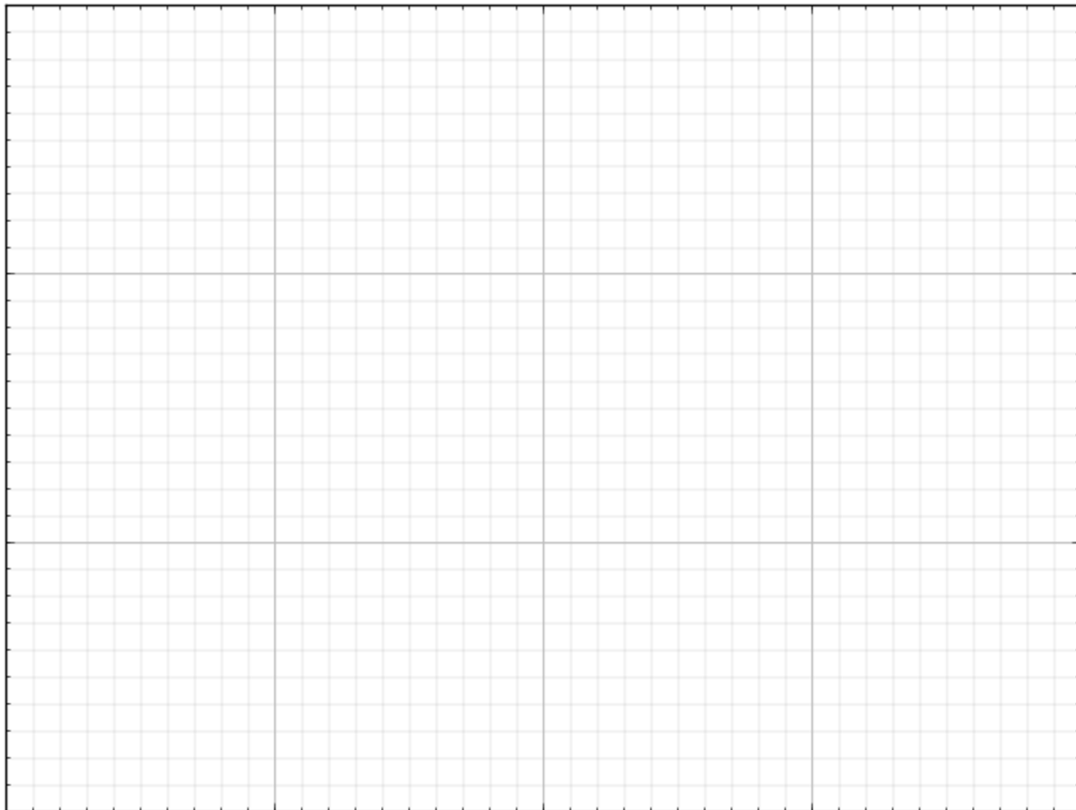


- 1) Find the parameter a .

2) Find and plot the cumulative distribution function $F(x)$.



- 3) Find and plot the inverse function $F^{-1}(u)$, where u is a random variable such that $0 \leq u \leq 1$.



4) Write an Excel formula that generates this demand.

Excel Formula



Problem 3 (40 P):

Mr. Matar has a small store in the mall. He wants to stock his merchandise according to the demand. If he stocks too little, he loses the potential profit of \$3 per item. If he stocks too much, he pays storage fee of \$0.05 per item. You are asked to help Mr. Matar simulate his projected losses in order to find the best quantity stocked.

	A	B	C
1	Profit Loss	\$ 3.00	
2	Storage Loss	\$ 0.05	
3		Qty	10
4	Demand	Extra or Less	Loss
5			
6			
7			
8			
9			
10			

- 1) Write the formula for the demand, knowing that it is uniformly distributed between 7 and 12.

- 2) Write the formula generating the “Extra or Less”, meaning that this number should be negative if stocked less than the demand and positive if he stocked more than the demand.

- 3) Write the formula for the loss. Remember that in either case there would be a loss incurred by Mr. Matar (this is always negative).