

1. Problem 5.1 page 188 in textbook.
2. Problem 5.3 page 188 in textbook.
3. Problem 5.9 page 189 in textbook.
4. Problem 5.19 page 191 in textbook.
5. Clark Kent's first assignment after graduating from a prestigious MS program was to determine the replenishment policy of a set of items his company thought were not efficiently managed. After some effort he gathered the following data on a small set of items.

Annual demand	setup time	unit cost
32,000	6	\$130
20,000	5	50
56,000	6.5	10
12,000	4.5	40
40,000	4	10
9,600	2.5	20
3,200	4.5	80
14,400	3	10

Currently, the company is replenishing each of the items once per week incurring a total of 1872 setup hours per year with an average investment on inventory of about \$70,000.

Orders per year	Setup hours per year	Quantity per order	Average capital ¹ tied up on inventory
52	312	615	\$40,000
52	260	385	\$9,615
52	338	1,077	\$5,385
52	234	231	\$4,615
52	208	769	\$3,846
52	130	185	\$1,846
52	234	62	\$2,462
52	156	277	\$1,385
Total	1872		\$69,153.85

Clark's challenge is to explore and find more efficient replenishment policies that reduce the number of setup hours or the the average capital tied up on inventory or both. For your convenience a spreadsheet, named Clark.xls, with the four columns in Table 2 has been created and can be downloaded from the course web site. If you have trouble downloading the file, you can always replicate the spreadsheet by manually entering the numbers.

- (a) Play with the number of orders per year in the spreadsheet until you obtain a significant reduction on the number of setup hours per year while keeping the average capital tied up on inventory below \$70,000.
- (b) Now play with the number of orders per year in the spreadsheet to obtain a significant reduction on the average capital tied up on inventory without exceeding 1900 hours of setups per year.

- (c) Determine the optimal number of setup hours per year and the average capital tied up on inventory by using the EOQ formula if the inventory carrying cost per dollar per year is 20% and the cost per hour of setup is \$15.
- (d) Select an arbitrary point in the exchange curve (the hyperbola described in the notes) and then find the order intervals that would position you in that point of the exchange curve.