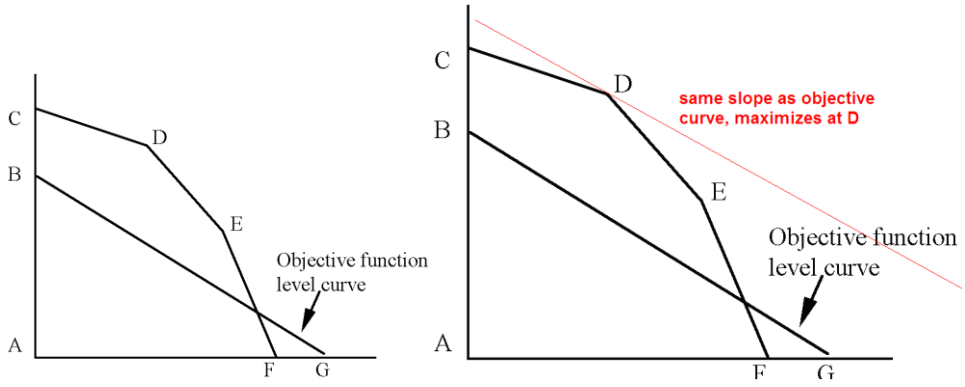
1. This graph shows the feasible region (defined by points ACDEF) and objective function level curve (BG) for a **maximization** problem. Which point corresponds to the optimal solution to the problem?



a. A
b. B
c. C
d. D
e. E

2. The following linear programming problem has been written to plan the production of two products. The company wants to maximize its profits.

X_1 = number of product 1 produced in each batch
X_2 = number of product 2 produced in each batch

MAX: $150\ X_1$ **+ 250** X_2
Subject to: $2\ X_1 + 5\ X_2 \leq 200$
$3\ X_1 + 7\ X_2 \leq 175$
$X_1, X_2 \geq 0$

How much profit is earned per each unit of product 2 produced?
a. 150
b. 175
c. 200
d. 250

3. A diet is being developed which must contain at least 100 mg of vitamin C. Two fruits are used in this diet. Bananas contain 30 mg of vitamin C and Apples contain 20 mg of vitamin C. The diet must contain at least 100 mg of vitamin C. Which of the following constraints reflects the relationship between Bananas, Apples and vitamin C?

a. $20 A + 30 B \geq 100$
b. $20 A + 30 B \leq 100$
c. $20 A + 30 B = 100$
d. $20 A = 100$

4. The objective function for a LP model is $3 X_1 + 2 X_2$. If $X_1 = 20$ and $X_2 = 30$, what is the value of the objective function?

a. 0
b. 50
c. 60
d. 120

5. What command is used to add the contents of cells A1, A2 and A3?

a. =A1+A2+A3
b. =ADD(A1:A3)
c. =TOTAL(A1:A3)
d. =PRODUCT(A1:A3)

Scenario 3-1

Jones Furniture Company produces beds and desks for college students. The production process requires carpentry and varnishing. Each bed requires 6 hours of carpentry and 4 hour of varnishing. Each desk requires 4 hours of carpentry and 8 hours of varnishing. There are 36 hours of carpentry time and 40 hours of varnishing time available. Beds generate $30 of profit and desks generate $40 of profit. Demand for desks is limited, so at most 8 will be produced.

Let X_1 = Number of Beds to produce
X_2 = Number of Desks to produce

The LP model for the problem is

MAX: $30 X_1 + 40 X_2$
Subject to: $6 X_1 + 4 X_2 \leq 36$ (carpentry)
$4 X_1 + 8 X_2 \leq 40$ (varnishing)
$X_2 \leq 8$ (demand for X_2)
$X_1, X_2 \geq 0$

	A	B	C	D	E
1		Jones Furniture			
2					
3		Beds	Desks		
4	Number to make:				Total Profit:
5	Unit profit:	30	40		
6					
7	Constraints:			Used	Available
8	Carpentry	6	4		36
9	Varnishing	4	8		40
10	Desk demand		1		8

6. Refer to Scenario 3-1. What formula should be entered in cell E5 in the accompanying Excel spreadsheet to compute total profit?
a. =B4*B5+C4*C5
b. =SUMPRODUCT(B8:C8,$B$4:$C$4)
c. =SUM(B5:C5)
d. =SUM(E8:E10)

7. Refer to Scenario 3-1. Which cells should be the constraint cells in this problem?
a. B4:C4
b. E5
c. D8:D10
d. E8:E10

Scenario 15-1
An investor is considering 4 investments, A, B, C and leaving his money in the bank. The payoff from each investment is a function of the economic climate over the next 2 years. The economy can expand or decline. The following payoff matrix has been developed for the decision problem.

	A	B	C	D
1		Payoff Matrix		
2				
3		Economy		
4	Investment	Decline	Expand	
5	A	0	85	
6	B	25	65	
7	C	40	30	
8	Bank	10	10	

Payoffs

8. Refer to Scenario 15-1. What decision should be made according to the maximax decision rule?
a. A
b. B
c. C
d. Bank