PART A

(1/1 point)

A corporation that produces gasoline and oil specialty additives purchases two grades of petroleum distillates, A and B. The company then combines the two according to specifications of the maximum percentages of grade B in each blend, given in Table 1.

Table 1: Description of Distillate B Components

	Max % allowed for Petroleum Distillate B	Selling price ($/gallon)
Deluxe	15%	7.9
Standard	60%	6.9
Economy	--	5.0

We would like to formulate a linear program to determine the production policy that maximizes profits. Define x_{AD}, x_{BD} as the number of gallons of Petroleum Distillates A and B used in making Deluxe; x_{AS}, x_{BS} as the number of gallons of Petroleum Distillates A and B used in making Standard; x_{AE}, x_{BE} as the number of gallons of Petroleum Distillates A and B used in making Economy. Select the correct objective and necessary linear constraints from below:

- [x] $\text{MAX } 7.9(x_{AD} + x_{BD}) + 6.9(x_{AS} + x_{BS}) + 5.0(x_{AE} + x_{BE}) - 0.6(x_{AD} + x_{AS} + x_{AE}) - .52(x_{BD} + x_{BS} + x_{BE})$
- [ ] $\text{MAX } (x_{AD} + x_{BD}) + (x_{AS} + x_{BS}) + (x_{AE} + x_{BE}) - 0.6(x_{AD} + x_{AS} + x_{AE}) - .52(x_{BD} + x_{BS} + x_{BE})$
- [ ] $\text{MAX } 7.9(x_{AD} + x_{BD}) + 6.9(x_{AS} + x_{BS}) + 5.0(x_{AE} + x_{BE}) - 0.52(x_{AD} + x_{AS} + x_{AE}) - 6(x_{BD} + x_{BS} + x_{BE})$
- [x] $x_{AD} + x_{AS} + x_{AE} \leq 4000$
- [ ] $x_{AD} + x_{AS} + x_{AE} \geq 4000$
- [ ] $x_{AD} + x_{AS} + x_{AE} = 4000$
- [x] $x_{BD} + x_{BS} + x_{BE} \leq 5000$
- [ ] $x_{BD} + x_{BS} + x_{BE} \geq 5000$

- [ ] $x_{BD} + x_{BS} + x_{BE} = 5000$
- [ ] $\frac{x_{BD}}{x_{AD}+x_{BD}} \leq 0.15$
- [ ] $\frac{x_{BS}}{x_{BS}+x_{AS}} \leq 0.6$
- [x] $-0.15x_{AD} + 0.85x_{BD} \leq 0$
- [ ] $-0.85x_{AD} + 0.15x_{BD} \leq 0$
- [ ] $-0.4x_{AS} + 0.6x_{BS} \leq 0$
- [x] $-0.6x_{AS} + 0.4x_{BS} \leq 0$
- [x] $x_{AD}, x_{AS}, x_{AE}, x_{BD}, x_{BS}, x_{BE} \geq 0$

✔

You have used 1 of 3 submissions

PART B

(1/1 point)

Use the spreadsheet PS1_P4.xlsx to solve the previous linear program

What is the maximum profit you get? Use two decimals.

Google sheets version available here

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You have used 3 of 5 submissions

PART C

(1/1 point)

If you could buy more Distillate A, would you?

- (•) Yes ✔
- ( ) No

You have used 1 of 1 submissions