

An ice cream parlor sells cartons of ice cream and cartons of frozen custard. The ice cream and custard are ordered by the case and sold by the carton for the prices shown below.

Ice Cream	Frozen Custard
12 cartons per case	10 cartons per case
Case cost: \$20	Case cost: \$25
Selling Price: \$3.50 per carton	Selling price: \$4.50 per carton
Profit: \$22 per case	Profit: \$20 per case

The manager of the ice cream parlor needs to order no more than 240 cartons of ice cream and frozen custard and spend no more than \$500.

- PART A Let x represent the number of cases of ice cream ordered, and y represent the number of cases of frozen custard ordered. Write two inequalities to model the ordering constraints.
- PART B Let P represent the total profit earned from selling x cases of ice cream and y cases of frozen custard. Write a profit function.
- PART C Graph the system of inequalities on a coordinate grid and shade the feasible region. Identify the coordinates of the vertices of the region.
- PART D Evaluate your profit function at each of the vertices of the feasible region. How many cases of each item should the manager order to maximize profit? What will the total cost be? What will the total profit be? Explain the steps towards your answer.

Provide answers, explanations, and show work in the box below.