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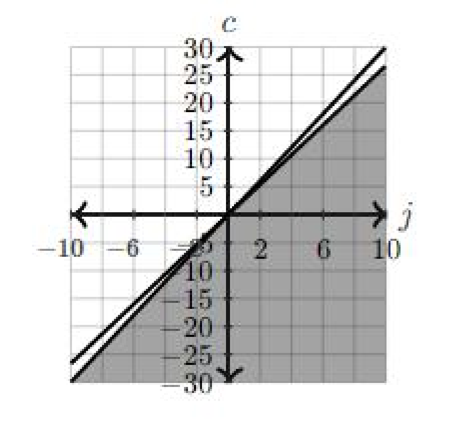
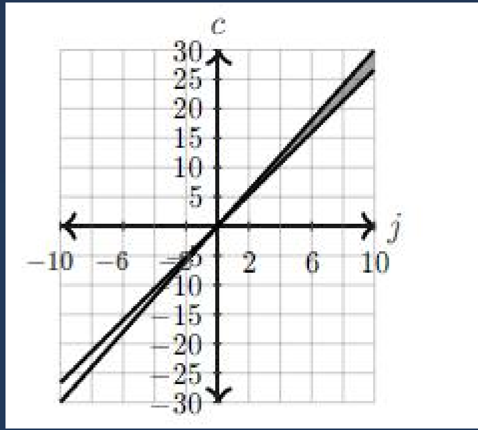
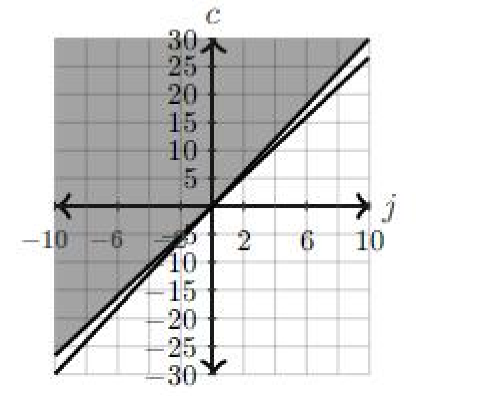
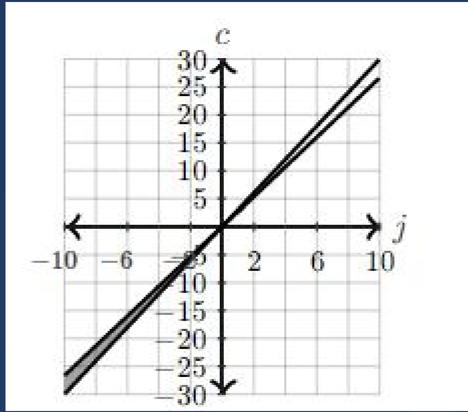
Systems of linear inequalities word problems

1.A company sells candy in jars that each have a volume of 3 cups. Each jar is filled above a certain line, guaranteeing that it has more than $\frac{8}{3}$ cups of candy. Which of the following graphs shows the possible volumes of candy, c, in cups, a customer may have, given that they bought j jars of candy?









2.Prachi needs between 240 and 260 total feet of fence panels. The home improvement store has 24 short (6-foot) fence panels and 28 long (8-foot) fence panels in stock. Which of the following combinations of fence panels could she buy?

A. 6 short fence panels and 26 long fence panels
B. 8 short fence panels and 23 long fence panels
C. 27 short fence panels and 12 long fence panels
D. 30 short fence panels and 10 long fence panels

3.Aaron is purchasing party hats and fake mustaches for an end of the school year party. He can spend at most $30. Fake mustaches cost $3 each, and party hats cost $2 each. If he must purchase a combination of at least 15 mustaches and party hats, which of the following systems of inequalities best models the relationship between the number of mustaches, m, and party hats, p, described above?

$\begin{cases} m+p \geq 15 \\ 3m+2p \leq 30 \end{cases}$ $\begin{cases} m+p \leq 15 \\ m+P \geq 30 \end{cases}$ $\begin{cases} 3m+2p \geq 15 \\ m+p \leq 30 \end{cases}$ $\begin{cases} 3m+2p \leq 15 \\ m+p \geq 30 \end{cases}$

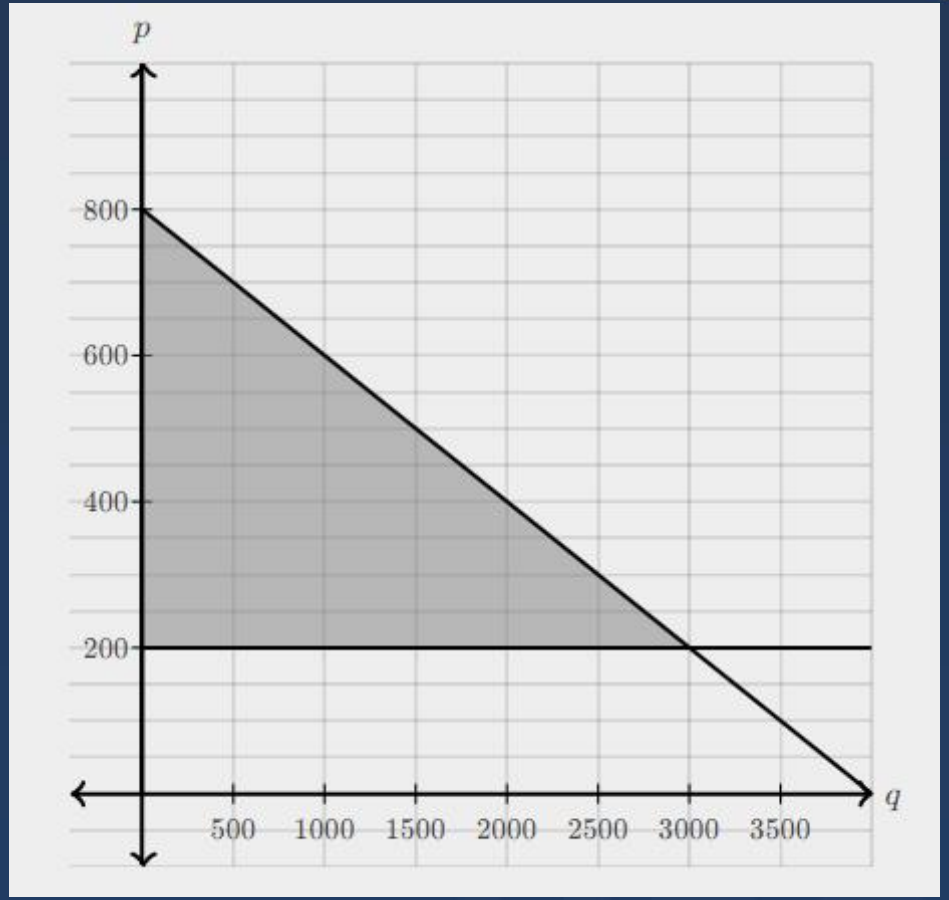
Tony is raising funds for his school soccer team by selling boxes of candy and t-shirts. His goal is to make more than $300 dollars overall. Each box of candy that Tony sells earns him $15, and each t-shirt sold earns him $20. If Tony wants to sell at least as many t-shirts as boxes of candy, then which of the following systems of inequalities best models the relationship between the number of boxes of candy, c, and t-shirts, t, described above?

$\begin{cases} c+t>300 \\ 20t \le 15c \end{cases}$ $\begin{cases} c+t>300 \\ 20t \ge 15c \end{cases}$ $\begin{cases} 15c+20t>300 \\ t \ge c \end{cases}$ $\begin{cases} 15c+20t>300 \\ t \le c \end{cases}$

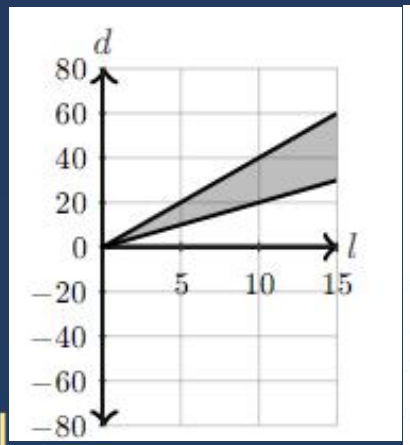
In a standard economic supply and demand graph, consumer surplus is defined as the area greater than or equal to the equilibrium price of a good and less than or equal to the demand line. The system of linear inequalities written and graphed at left, where p represents price and q represents the quantity of units that consumers will demand, shows the consumer surplus area for a tablet computer that recently entered the U.S. marketplace. What is the maximum quantity of the tablet that consumers will demand and still have it remain in the consumer surplus area of the graph?

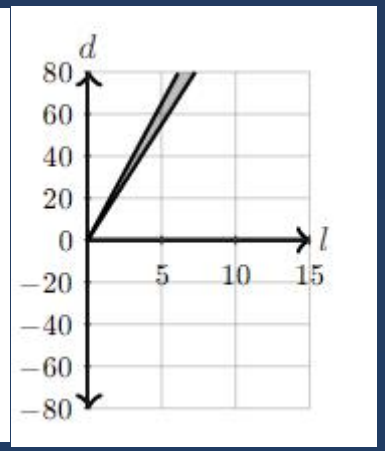
$q \leq 4000-5p$
$p \geq 200$
$q \geq 0$

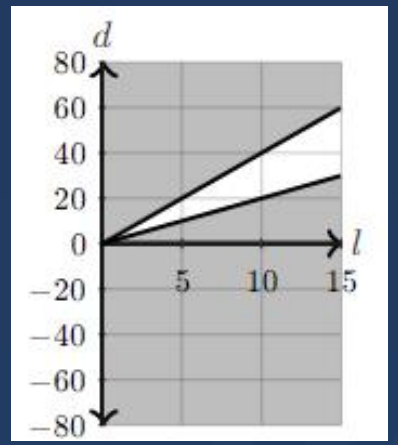
A. 200
B. 800
C. 2800
D. 3000

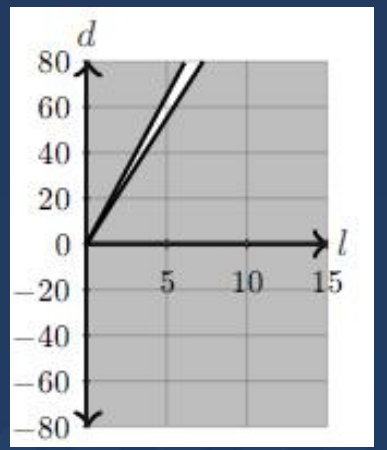


Julia mows lawns in the summer for $15 per lawn. It costs Julia between $2 and $4 to mow 1 lawn. If l represents the number of lawns Julia mows, which graph correctly shades the possible values of Julia's net earnings, d, in dollars?

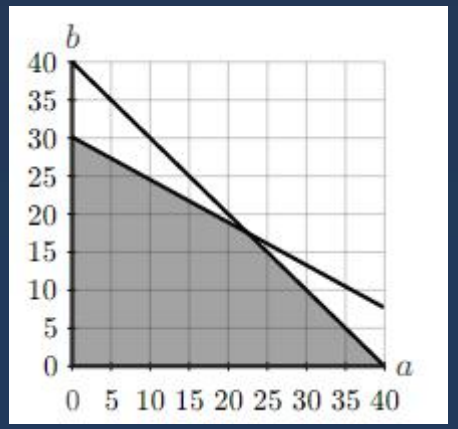


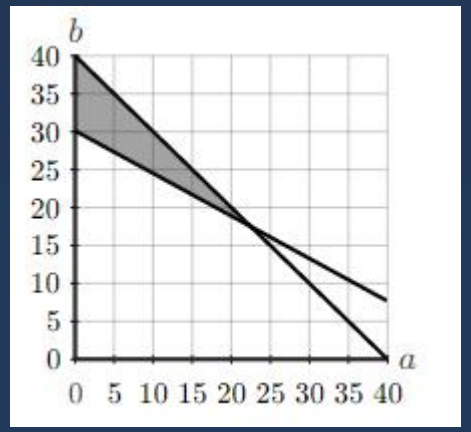


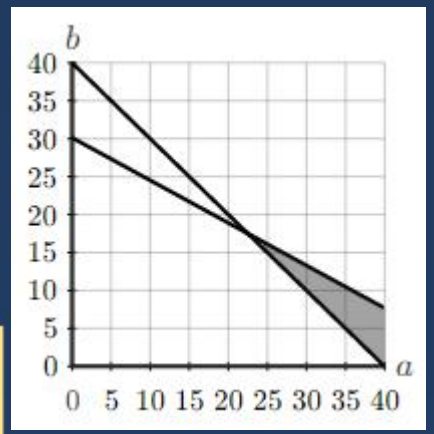


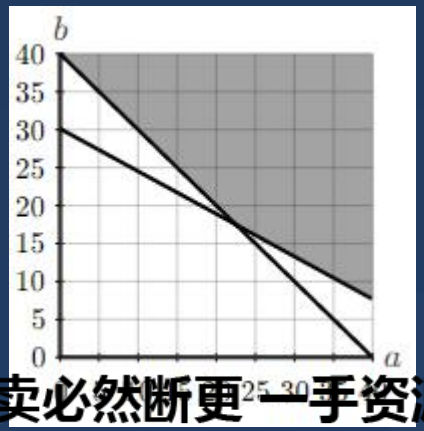


Cecília has 2 jobs. The first job pays $8.20 per hour and the second job pays $14.60 per hour. Each week, Cecília can work no more than 40 hours, but she needs to make at least $440. In one week, Cecília works a hours at the first job and b hours at the second job. Which graph represents the number of hours that Cecília can work at each of her two jobs to satisfy these conditions?

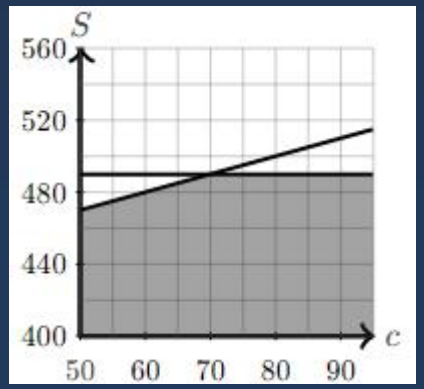


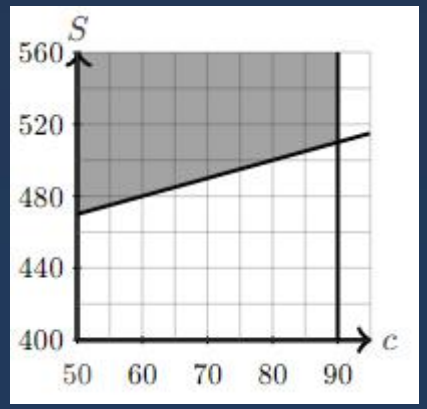


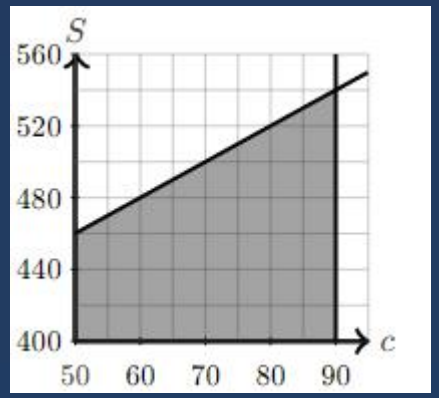


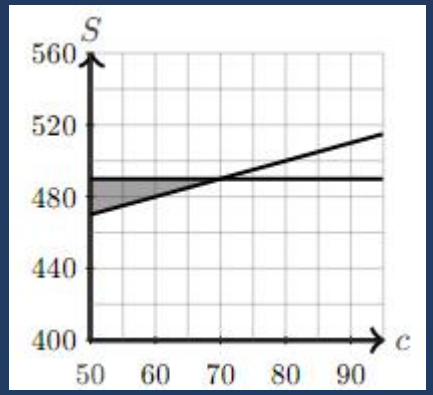


A car dealership can have up to 90 cars on its lot. According to dealership predictions, when the average number of cars on the lot is 60, then at most 480 cars are sold per year. Whenever the average number of cars on the lot increases by 1, the dealership sells up to 2 more cars per year. Which of the following graphs represents the predicted car sales per year, S, based on the average number of cars on the lot, c?









A rancher wants to build a rectangular pen for her animals. She decides that the length, l, of one side of the pen should be at most 60 feet, the width, w, of one side of the pen should be at least 30 feet, and the perimeter of the pen should be at most 200 feet. Which of the following systems of inequalities best models the situation described above?

$$\begin{cases} l + w \leq 200 \\ w \geq 30 \\ l \leq 60 \end{cases} \quad \begin{cases} l + w \geq 200 \\ w \leq 30 \\ l \geq 60 \end{cases} \quad \begin{cases} l + w \leq 100 \\ w \geq 30 \\ l \leq 60 \end{cases} \quad \begin{cases} 2l + 2w \geq 200 \\ w \geq 30 \\ l \leq 60 \end{cases}$$

A bottle weighs 50 grams and holds up to 2 liters of liquid. A chemist is filling the bottle with x grams of liquid ethanol and y grams of liquid water. Ethanol has a density of 789 grams per liter and water has a density of 1,000 grams per liter. The chemist wants the mass of the filled bottle to be less than 1,800 grams. Which of the following systems of inequalities best models the situation described above?

$\begin{cases} x+y<1750 \\ 789x+1000y \leq 2 \end{cases}$ $\begin{cases} x+y<1750 \\ \frac{x}{789}+\frac{y}{1000} \leq 2 \end{cases}$ $\begin{cases} x+y<1850 \\ 789x+1000y \leq 2 \end{cases}$ $\begin{cases} x+y<1850 \\ \frac{x}{789}+\frac{y}{1000} \leq 2 \end{cases}$

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Thanks

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