

LESSON
3-4

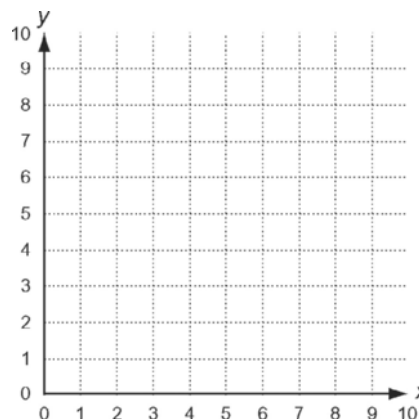
Practice C

Linear Programming

Solve.

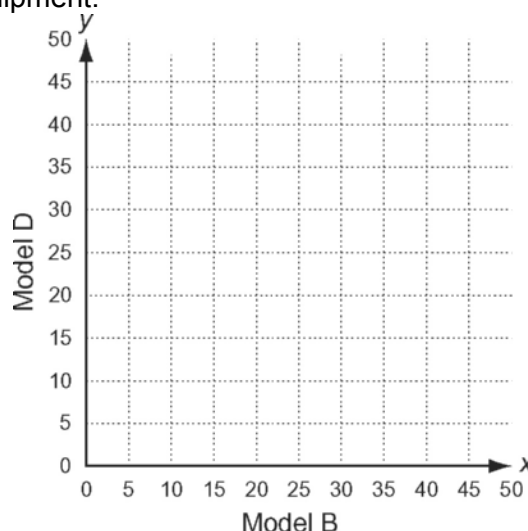
1. Maximize $P = 4.5x + 2.5y$

for the constraints $\begin{cases} y \geq 0 \\ x \geq 0 \\ y \geq x \\ y \leq -2x + 9 \end{cases}$ _____



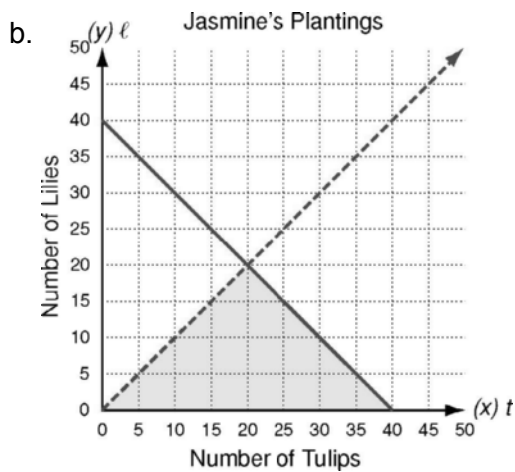
2. Rita is production manager at a company that is manufacturing a new athletic training machine. There are 4 models. Models B and D are needed for the next shipment. Between 10 and 30 of model B are needed. Rita can use no more than 100 hours of production time and she wants to maximize the profit. Use the table to determine how many of each machine Rita should produce for the next shipment.

Athletic Trainer		
Model	Production Time (h)	Profit per Item
A	6.5	\$125
B	2.5	\$80
C	4.25	\$90
D	5.0	\$100



3. A department store is planning to hire up to 24 temporary employees for a tent sale. Experienced workers will be paid \$20 per hour and inexperienced workers \$15 per hour. The company can pay up to \$400 per hour for the temporary employees. An experienced worker produces 1.5 times the profit that an inexperienced worker produces. How many of each type of worker should be hired?



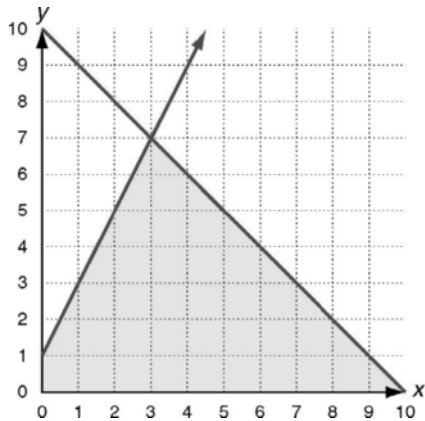


c. 19

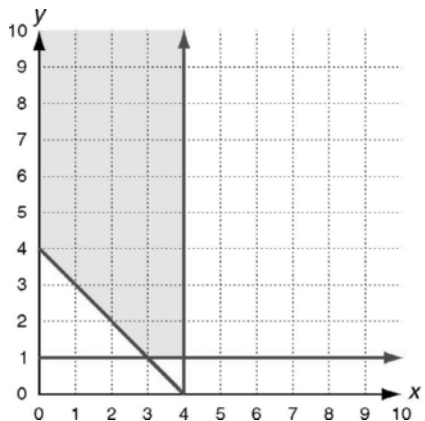
d. 1

Practice B

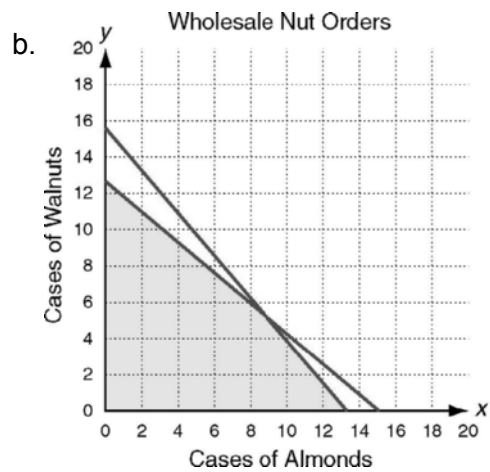
1. (10, 0)



2. (3, 1)



3. a.
$$\begin{cases} x \geq 0 \\ y \geq 0 \\ 20x + 24y \leq 300 \\ 30x + 26y \leq 400 \end{cases}$$

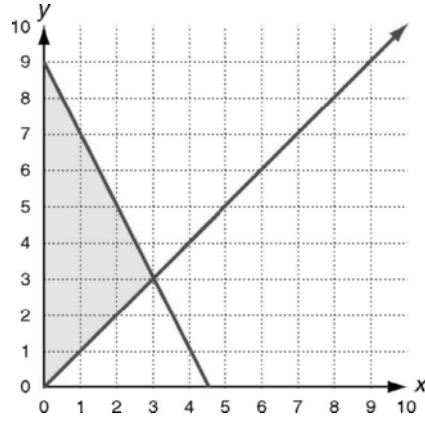


c. $P = 17x + 15y$

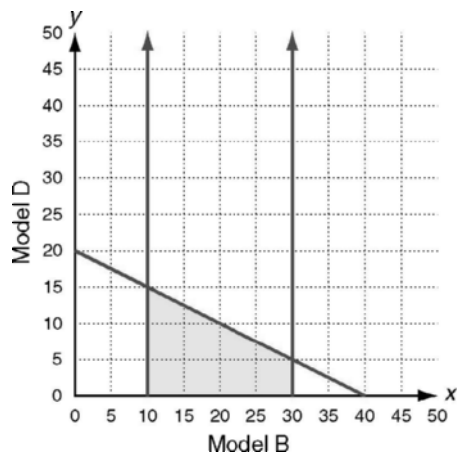
d. 9 cases of almonds, 5 cases of walnuts

Practice C

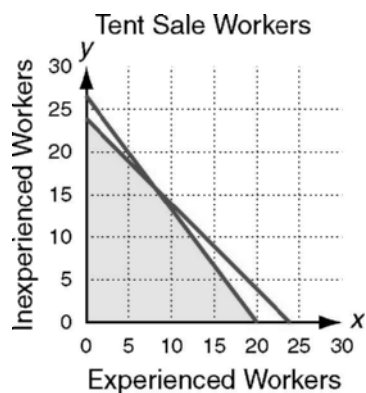
1. (0, 9)



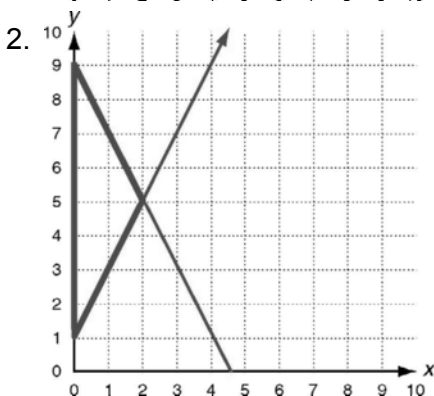
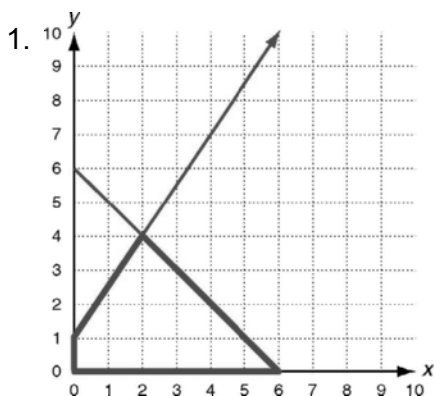
2. 30 of Model B and 5 of Model D



3. 20 experienced, 0 inexperienced



Reteach



3. $(0, 0)$, $(0, 1)$, $(2, 4)$, $(6, 0)$

$$P(0, 0) = 0$$

$$P(0, 1) = 5$$

$$P(2, 4) = 24$$

$$P(6, 0) = 12$$

$$\text{max at } (2, 4)$$

4. $(0, 1)$, $(0, 9)$, $(2, 5)$

$$P(0, 1) = 6$$

$$P(0, 9) = 54$$

$$P(2, 5) = 36$$

$$\text{min at } (0, 1)$$

Challenge

1. a. $D: w + i + g \leq 100$

b. $E: 35w + 80i + 70g \leq 6300$

2. $P = 60w + 75i + 90g$

3.

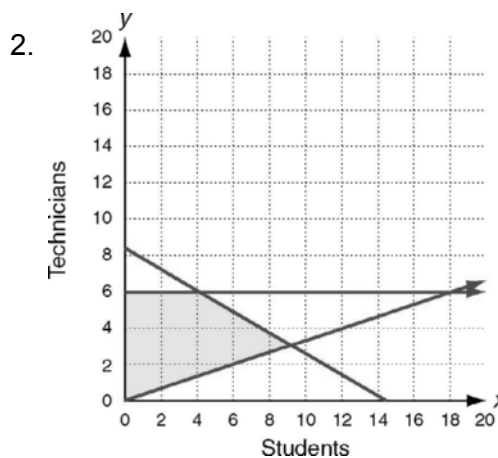
System of inequalities	Intersection	Feasible	Dollar value of P
A, B, C	$(0, 0, 0)$	Yes	0
A, B, D	$(0, 0, 100)$	No	—
A, B, E	$(0, 0, 90)$	Yes	8100
A, C, D	$(0, 100, 0)$	No	—
A, C, E	$(0, 78.75, 0)$	Yes	5906.25
A, D, E	$(0, -70, 170)$	No	—
B, C, D	$(100, 0, 0)$	Yes	6000
B, C, E	$(180, 0, 0)$	No	—
B, D, E	$(20, 0, 80)$	Yes	8400
C, D, E	$(37.78, 62.22, 0)$	Yes	6933.33

4. Produce 20 boxes of wood and 80 boxes of stained glass

5. \$8400

Problem Solving

1. $x \geq 0$, $y \geq 0$, $y \leq 6$, $y \geq \frac{1}{3}x$, $y \leq \frac{100 - 7x}{12}$



3. $(0, 0)$, $(0, 6)$, $(4, 6)$, $(9, 3)$

4. $C = x + 2y$

5. $(4, 6)$

6. 6 technicians and 4 students

7. D

8. C