✎ Test 1 (Lessons 1–2): Extending Linear Systems of Equations and Inequalities
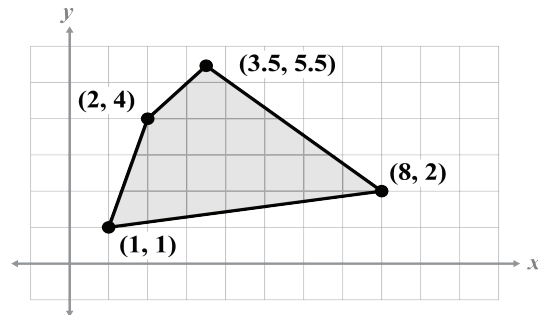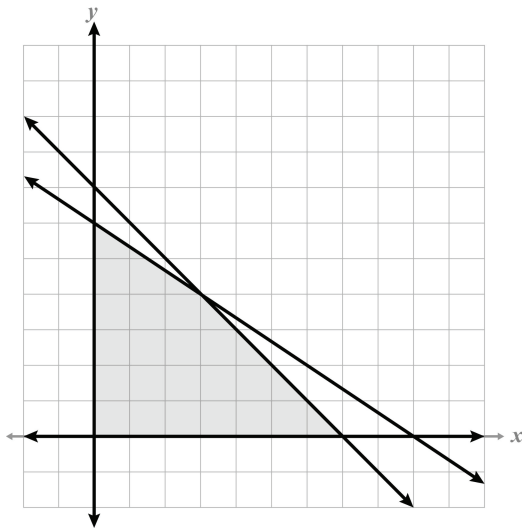
1) Using the objective function, determine the value of each vertex. Name the minimum and maximum.

$f(x, y) = -3x + 2y$

2) Write a system of inequalities to represent the given graph.

3) Using the objective function, determine the value of each vertex from problem 2. Name the minimum and maximum.

$f(x, y) = 5x + y$

For problems 4–7, use the word problem to answer.

Kenzie and River are knitting scarves (x) and sweaters (y). From experience, they know it will take at least 15 hours to make items for the craft fair. Each scarf takes 4 hours to knit and each sweater takes 10 hours. The maximum time the pair has before the craft fair is 120 hours. They also agreed to spend at least 2 hours of their total knitting time just on sweaters.

4) Write the system of inequalities for the problem.

5) Graph the system of linear inequalities.
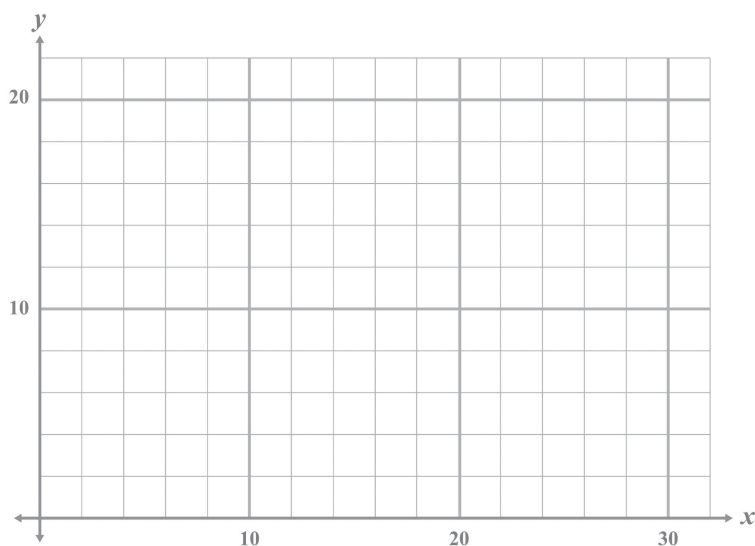
6) Write the objective function if the scarves are sold for \$15 and the sweaters are sold for \$60.

7) What is the maximum profit Kenzie and River can earn at the craft fair? Show your work and explain your thinking.

8) Solve the system of equations. Show your work.

$A: 2x - y + 4z = 5$

$B: x + 3y - 2z = 8$

$C: 3x + 3y - z = 9$

For problems 9–10, use the word problem to answer.

The average of three tests is 86%. The range is 25. The difference between the middle and lowest test scores is 8.

9) Define your variables and write a system of equations.

10) Solve the system.