

**LESSON**  
**4.1****Interdisciplinary Application***For use with the lesson "Write Linear Equations in Slope-Intercept Form"***Break-Even Analysis**

**Economics** One of the most important aspects of business management is determining the price a company will charge for goods and services. Companies will often choose to price products to maximize profits. Another consideration is the cost associated with developing the good or service. One tool used by managers to analyze costs is break-even analysis.

A break-even analysis will determine the quantity of a product that must be sold before the seller begins to make a profit. The analysis takes into consideration variable costs and fixed costs. Variable costs change with the quantity of product produced while fixed costs remain constant. Examples of fixed costs are rent, insurance, administrative salaries, and equipment. Some variable costs are production worker's wages, material expense, and utilities expense.

By graphing both a revenue line and a cost line, a company can then determine a break-even point. This occurs when the revenue and cost lines intersect. This intersection point will be the quantity needed to at least cover costs of production. Any greater quantity will then start generating a profit.

**In Exercises 1–4, use the following information.**

A store can purchase T-shirts for \$7 each. It has fixed costs of \$2500. Each T-shirt is sold for \$18.

1. Write a linear equation for both cost and revenue.
2. Graph both the cost line and the revenue line.
3. Determine the break-even point.
4. If the store wants to make a profit of \$2000, how many T-shirts must it sell?

**In Exercises 5–8, use the following information.**

A hotdog stand can purchase hotdogs for \$.35 each and buns for \$.20 each. It has fixed costs of \$50. Each hotdog is sold for \$1.

5. Write a linear equation for both cost and revenue.
6. Graph both the cost line and revenue line.
7. Determine the break-even point.
8. If the stand wants to make a profit of \$400, how many hotdogs must it sell?