

1. Consider the *We Are Jeans* store. It costs the business \$29 to make a pair of jeans. This includes materials and labor. There's also the fixed cost amount to consider. Fixed costs can include salaries of employees, insurance, mortgage payments, equipment, and so on. The fixed costs are shared by all the different products sold. In this case, for the jeans, the fixed costs come to \$1,000. The store sells the jeans for \$49 per pair. How many pairs of jeans do they have to sell to start making a profit on them? What is the break-even point?

$$C(x) = 29x + 1000$$

$$R(x) = 49x$$

Break-even point: 50 pairs of jeans, \$2450

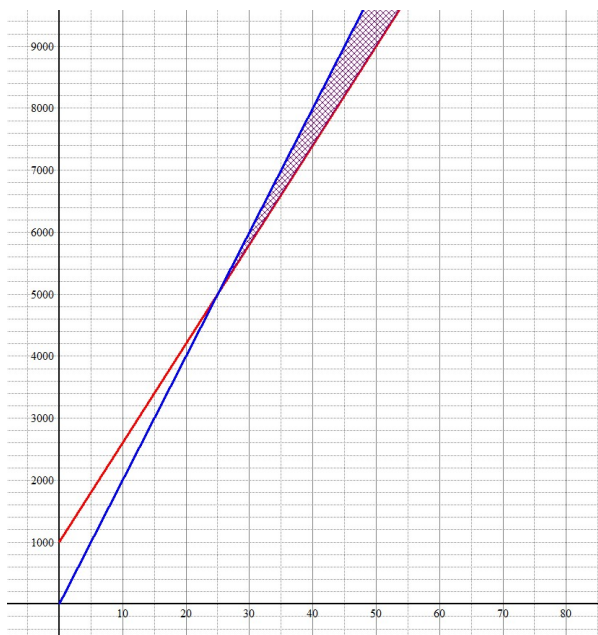
Any jeans produced and sold after the 50<sup>th</sup> pair will produce a profit.

2. You are a manager of a small company that produces and sells pavers for driveways. You sell the pavers in bundles that cost \$200, and each bundle has 144 pavers in it. You have \$1000 in fixed costs each month and it costs you \$160 to produce each bundle of pavers. How many bundles of pavers do you need to sell each month to break even? Create a model of your linear equations and shade the area that represents profit. What would your profit be if you sold 30 bundles of pavers? 20 bundles?

$$C(x) = 160x + 1000$$

$$R(x) = 200x$$

Break-even point: 25 bundles of pavers, \$5000



At 30 bundles of pavers, the company would have a profit of \$200.

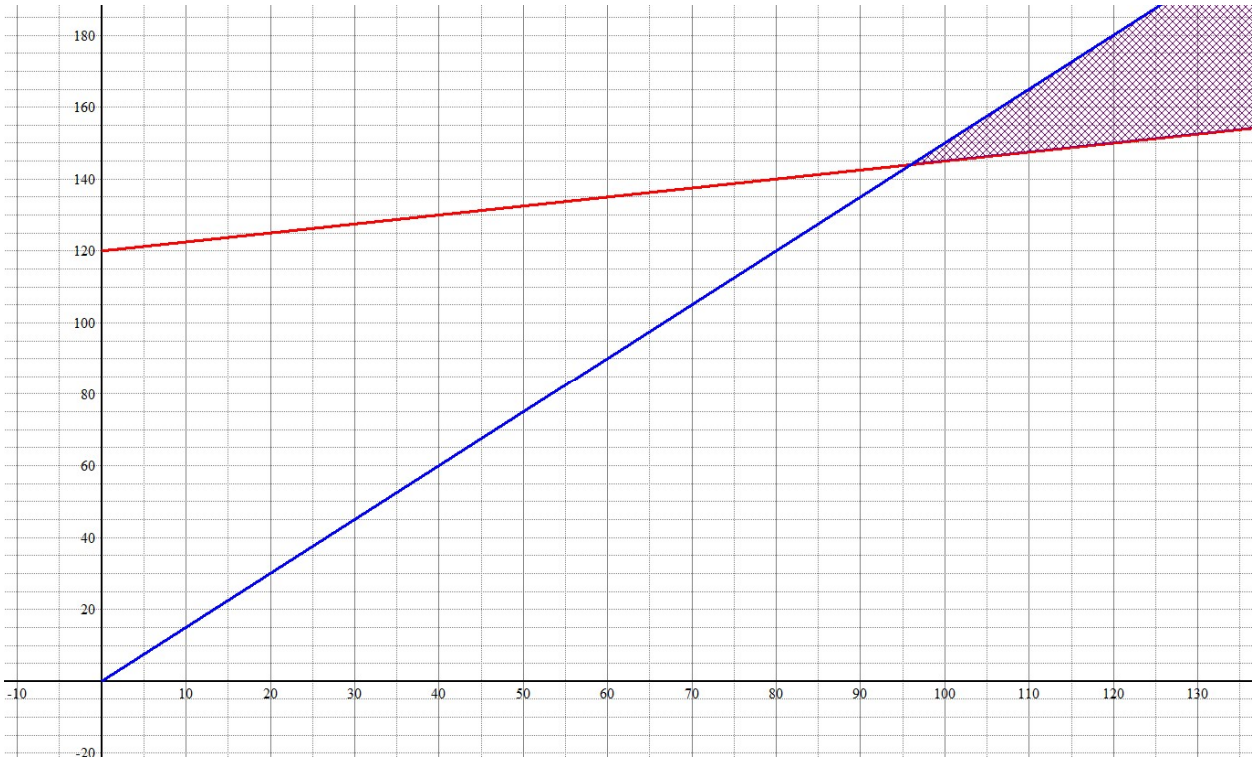
At 20 bundles of pavers, the company would have a loss of \$200.

3. You decide to sell snow cones at a local park as a summer job. The snow cone machine costs \$120 per month to rent. The cost to make each snow cone is \$0.25. If you sell each snow cone for \$1.50, determine the break-even point each month. Create a model of your linear equations and shade the area that represents profit.

$$C(x) = 0.25x + 120$$

$$R(x) = 1.50x$$

Break-even point: 96 snow cones, \$144



4. A coffee bean importer is analyzing his start-up business finances. He will have spent \$40,180 on means of transportation, and warehousing. It will cost him \$0.80 per pound of imported coffee beans. If he can sell the beans for \$1.78 per pound, how many pounds of coffee will he need to import? How much profit will he make if he imports 30,000 pounds of beans? How much profit will he make if he imports 50,000 pounds of beans?

$$C(x) = 0.80x + 40180$$

$$R(x) = 1.78x$$

Break-even point: 41,000 pounds of coffee beans, \$72,980

At 30,000 pounds of beans the company loses \$10,780.

At 50,000 pounds of beans the company has profits of \$8,820.

5. The solar panel manufacturing company you work for must consider many variables in the business to make its many decisions. The company records show that fixed costs over the past year have averaged \$8000 per month. In addition, each panel costs \$95 in materials and \$55 in labor to manufacture. A marketing survey indicates that the company can sell all the panel it produces if the panels are priced at \$350 each. How many panels need to be sold each month to break even? How much money will the company make if they sell 20 panels next month? 100 panels?

$$C(x) = 150x + 8000$$

$$R(x) = 350x$$

Break-even point: 40 panels, \$14,000

At 20 panels the company loses \$4,000.

At 100 panels the company has profits of \$12,000.

6. A small business produces soap and lotion gift baskets. Labor, utilities, and other fixed expenses cost \$6,000 a month. Each basket costs \$8 to produce, and sells for \$20. How many baskets does the company need to sell each month to break even?

$$C(x) = 8x + 6000$$

$$R(x) = 20x$$

Break-even point: 500 baskets, \$10,000