

Worksheet: Using Systems of Equations to Investigate Profits



Q1: A stuffed animal business has a cost function of $C = 12x + 30$ and a revenue function $R = 20x$. First, find the break-even point. Then, calculate the corresponding revenue.



Question Video

A $x = \frac{15}{4}, R = 75$

B $x = 0, R = 75$

C $x = 75, R = \frac{15}{4}$

D $x = 75, R = 0$

Q2: A guitar factory has a cost of production given by $C(x) = 75x + 50\,000$. If the company needs to break even after 150 units sold, at what price should they sell each guitar? Give your answer to the nearest dollar.



Question Video

A \$408

B \$666

C \$409

D \$667

Q3: A musician charges $C(x) = \$(64x + 20\,000)$, where x is the total number of attendees at the concert. The venue charges \$80 per ticket. After how many sold tickets does the venue break even, and what is the value of the total tickets sold at that point?

A 1 250 tickets, \$100 000

B 139 tickets, \$11 120

C 1 500 tickets, \$116 000

D 2 000 tickets, \$160 000

Q4: A cell phone factory produces x cellphones with cost $C(x) = 150x + 10\,000$ and revenue $R(x) = 200x$. What is the breakeven point?

A $x = \frac{100}{7}$

B $x = 0$

C $x = \frac{200}{7}$

D $x = 200$

E $x = 40\,000$

Q5: A fast-food restaurant has a cost of production $C(x) = 11x + 120$ and a revenue function $R(x) = 5x$. When does the company start to turn a profit?

- A when $x = 20$
- B never
- C when $x = 100$
- D when $x = 7.5$

Q6: A laptop company has discovered that their cost and revenue functions for each day are $C(x) = 3x^2 - 10x + 200$ and $R(x) = -2x^2 + 100x + 50$. Find the maximum and minimum number of laptops they could produce each day while still making a profit.

Hint: Your answers should be integers.

- A minimum: 1 laptop, maximum: 21 laptops
- B minimum: 2 laptops, maximum: 20 laptops
- C after 51 computers
- D minimum: 2 laptops, maximum: 21 laptops