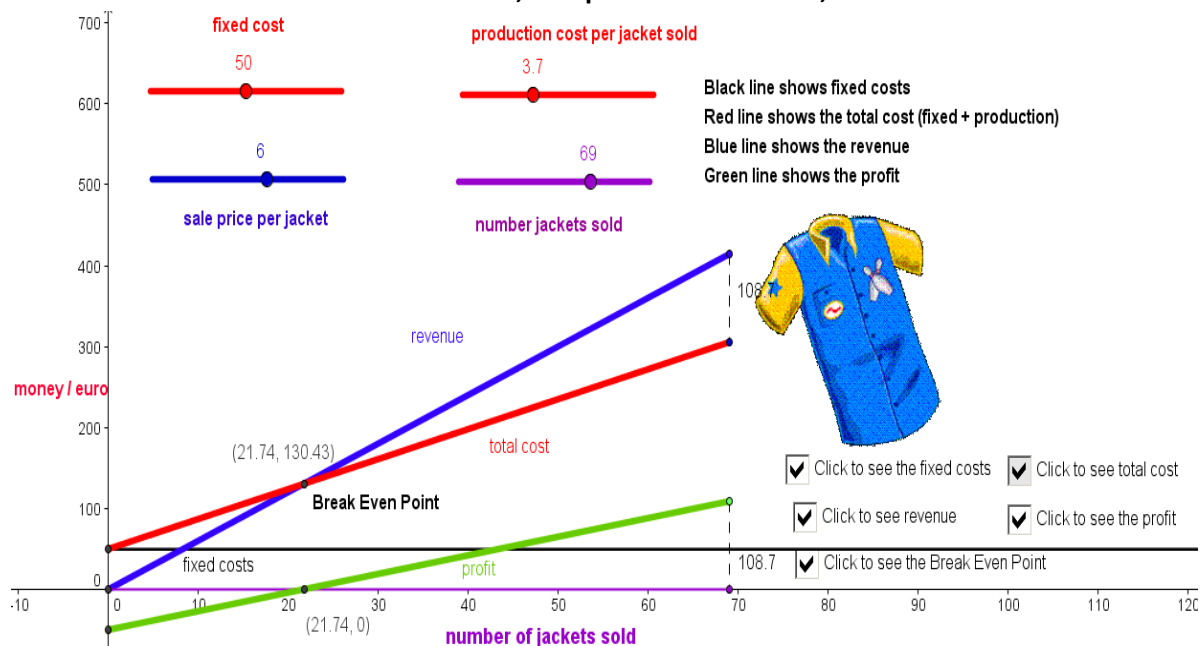


Student Activity: Inequalities in context

Use in connection with the interactive file, 'Inequalities in Context', on the student's CD.



Note: Revenue equals the money received from the sale of the jackets.

1. The diagram above illustrates the financial situation of a sports shop, what two types of costs do the shop incur regarding the jackets it sells.

2. What effect does the number of jackets sold have on the fixed cost?

3. What effect does the number of jackets sold have on the production cost per jacket sold?

You are given the following information: (Assume this firm sells all jackets it produces.)

- x = the number of jackets sold
- fixed cost = €50
- production cost per jacket = €3.70
- sale price per jacket = €6

- a. Write a formula in terms of x for the total cost of the jackets sold?

- b. Write an equation that describes the revenue in terms of x ?

- c. Which one of these inequalities represents the relationship between the total costs and the revenue when a profit is achieved? Explain your answer.

$$50 + 3.7x < 0$$

$$50 + 3.7x \leq 6x$$

$$6x > 0$$

$$50 + 3.7x \geq 6x$$

$$50 + 3.7x < 6x$$

- d. Solve the inequality that represents the relationship between the total cost and the revenue when the shop is making a profit.

- e. The owner of the shop has to decide the minimum number of jackets to produce in order to make a profit. How does the answer to the previous section of this question help him make this decision?

- f. What is meant by the “**Break Even**” point and what is the relationship between the total cost and the revenue at this point?

g. Express the profit in terms of x .

h. Write in terms of x the inequality that represents the situation where the business must make at least €200 profit on these jackets?

i. Solve the above inequality.

j. What information does the solution to this inequality give the owner of the business?

4. Complete the following table for a business that is considering manufacturing a new jacket given the following information: (Assume this firm sells all jackets it produces.)

- x = the number of jackets sold
- fixed costs = €100
- production costs per jacket = €5
- sale price per jacket = €10.

number of jackets produced	fixed cost	production cost per jacket manufactured	total cost	revenue	profit
0					
10					
20					
30					
40					

- a. On the graph paper provided draw the line that represents the fixed cost for these jackets. Be sure to clearly label each axis of the graph.
- b. On the same diagram draw the line that represents the total cost for these jackets.
- c. On the same diagram draw the line that represents the revenue for these jackets?
- d. On the same diagram draw the line that represents the profit for these jackets?



e. At what point in your diagram does the business start to make a profit on these jackets?

f. Write the total cost in terms of x the number of these jackets manufactured.

g. Write the revenue in terms of x the number of these jackets manufactured.

h. Write an inequality in terms of x the number of these jackets manufactured that represents the situation where the business is making a profit.

i. Solve the above inequality.

j. What information does the solution give you in the context of this business?

k. What is the minimum amount of jackets that must be produced in order to break even (or above which the business will make a profit)?

l. Use the diagram to find how much profit the business will make if it manufactures 120 of these jackets?

m. What is the expression in terms of x , the number of these jackets manufactured, that would represent the profit or loss?

n. What inequality would represent the situation where the business must make at least €200 profit on the sale of these jackets?

o. Solve the above inequality.

p. What information does the solution to this inequality give us in the context of this business?
