Answer on Question #40366, Math, Calculus

1. Business: Cost. A company's marginal cost function is MC(x)= 1/2X+1 and its fixed cost are 50. Find the cost function.

Solution.

$$MC(x) = \frac{1}{2x+1}$$

$$FC = 50$$

Marginal Cost

Marginal cost is the additional cost we have when we produce one more unit of the good. The most accurate way of calculating the marginal cost is with calculus. Marginal cost is essentially the rate of change of total cost, so it is the first derivative of total cost. So using our two formulas for total cost, we take the first derivate of total cost to find the expressions for marginal cost:

$$TC'(x) = MC(x)$$

$$TC = \int MC(x)dx = \int \frac{1}{2x+1}dx = \frac{1}{2}\ln(2x+1) + C$$

Fixed Cost

Our fixed cost is the costs we incur when we do not produce any units.

So, we substitute $x = 0$ to our equations.

$$FC = TC(x=0) = \frac{1}{2}\ln 1 + C = 50$$

$$\ln 1 = 0$$

$$C = 50$$

Therefore,

$$TC = \frac{1}{2}\ln(2x+1) + 50$$

Answer: cost function is $\frac{1}{2}\ln(2x+1) + 50$.