Assignment to 2.5

1. Given are the following data:

$C_f := 98$ C_f = Fixed cost

$C_v(x) := x^3 - 12x^2 + 60x$ C_v = Variable cost

$C(x) := C_f + C_v(x)$ C = Cost

Determine for $x := 0..10$ [x = quantity] the values C(x) and C(x+1) - C(x).

2. Determine for $x := 1..10$ and for the function $C(x) := 98 + 60x - 12x^2 + x^3$ the values:

$c_v(x) := \frac{C_v(x)}{x}$ c_v = variable cost per unit

$c_f(x) := \frac{C_f}{x}$ c_f = fixed cost per unit

$c(x) := \frac{C(x)}{x}$ c = total cost per unit

Determine the quantity at which c_v is a minimum and at which c is a minimum.

3. Given are the following data

$C_f := 50000$

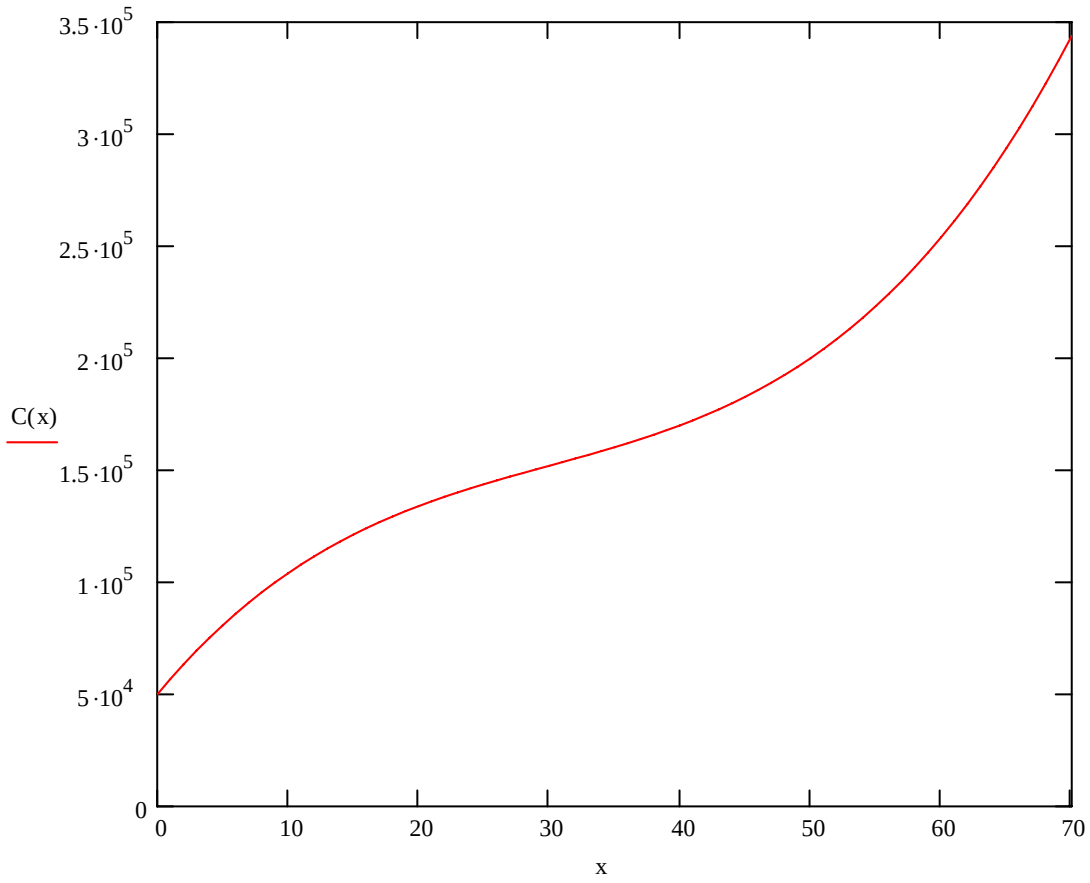
$C_v(x) := 7000x - 180x^2 + 2x^3$

$C(x) := C_f + C_v(x)$

At which quantity is the minimum of of the first derivative of C(x), the minimum of $c_v(x)$ and the minimum of c(x)?

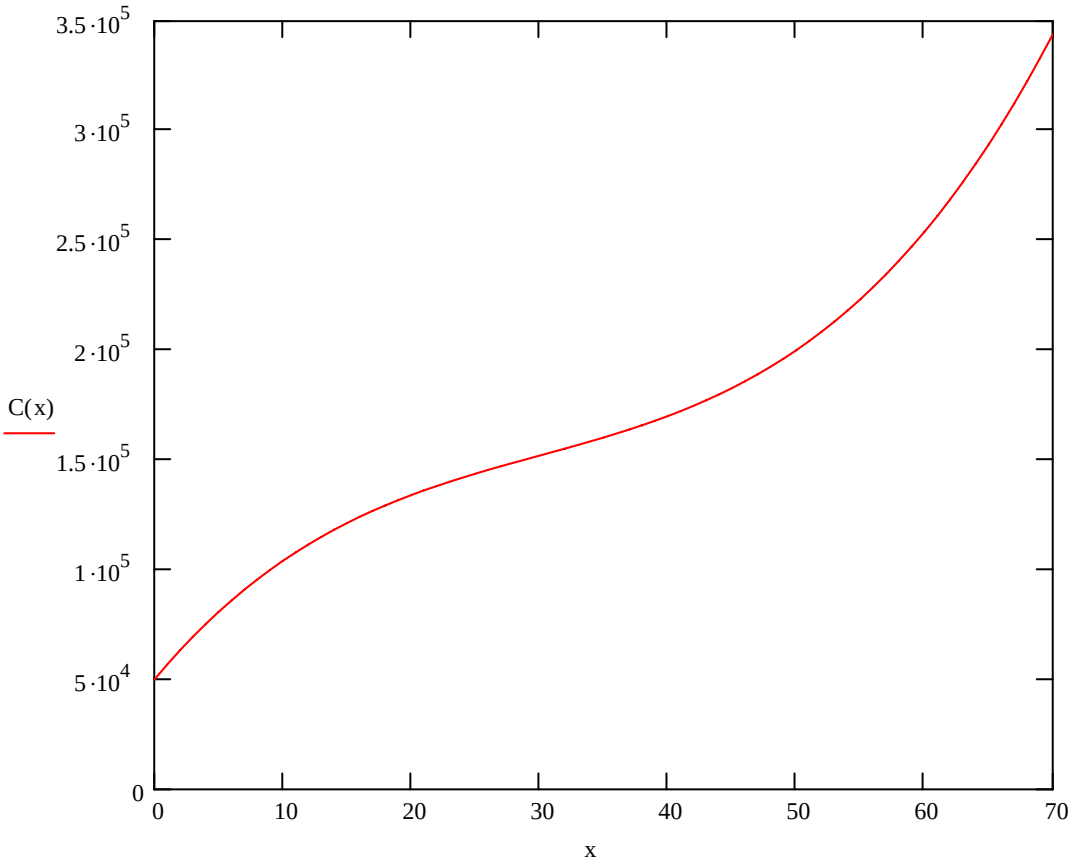
Assignment to 2.5

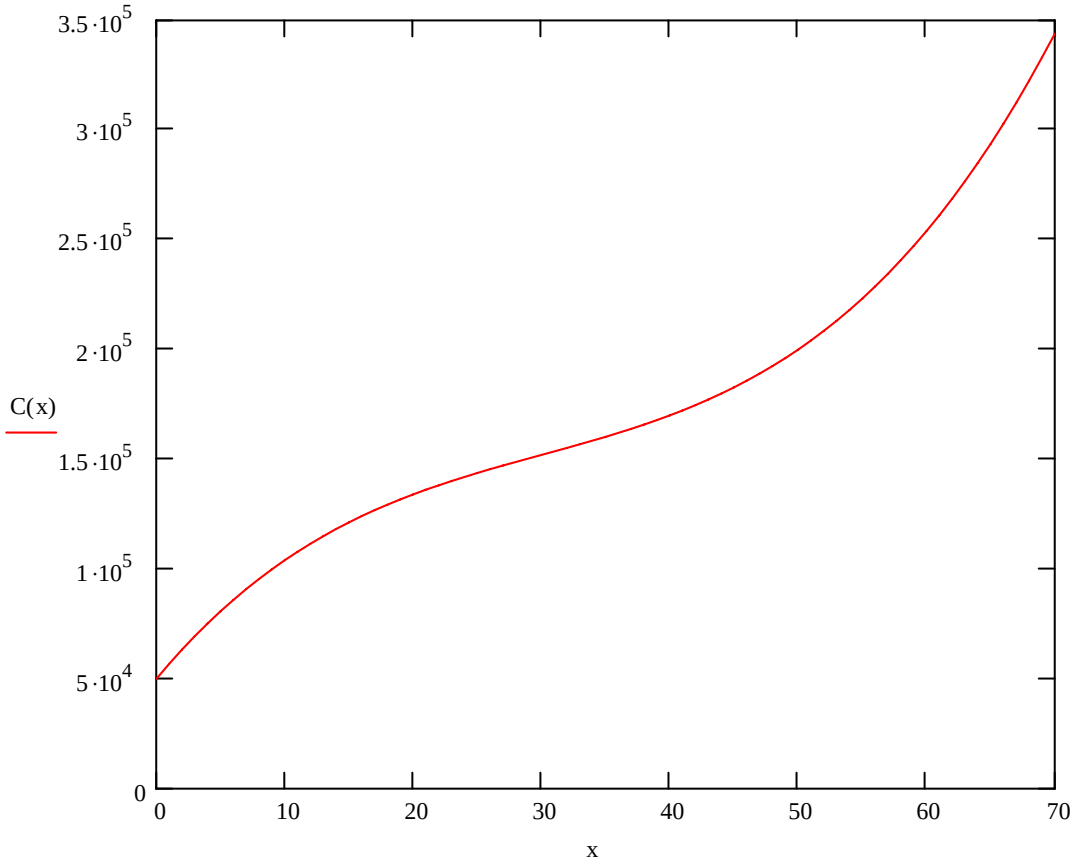
4. For $x := 0..70$ the function from assignment 3 can be illustrated as follows:



How can the minima of C', c_v and c be found graphically? You may make use of the following figures.

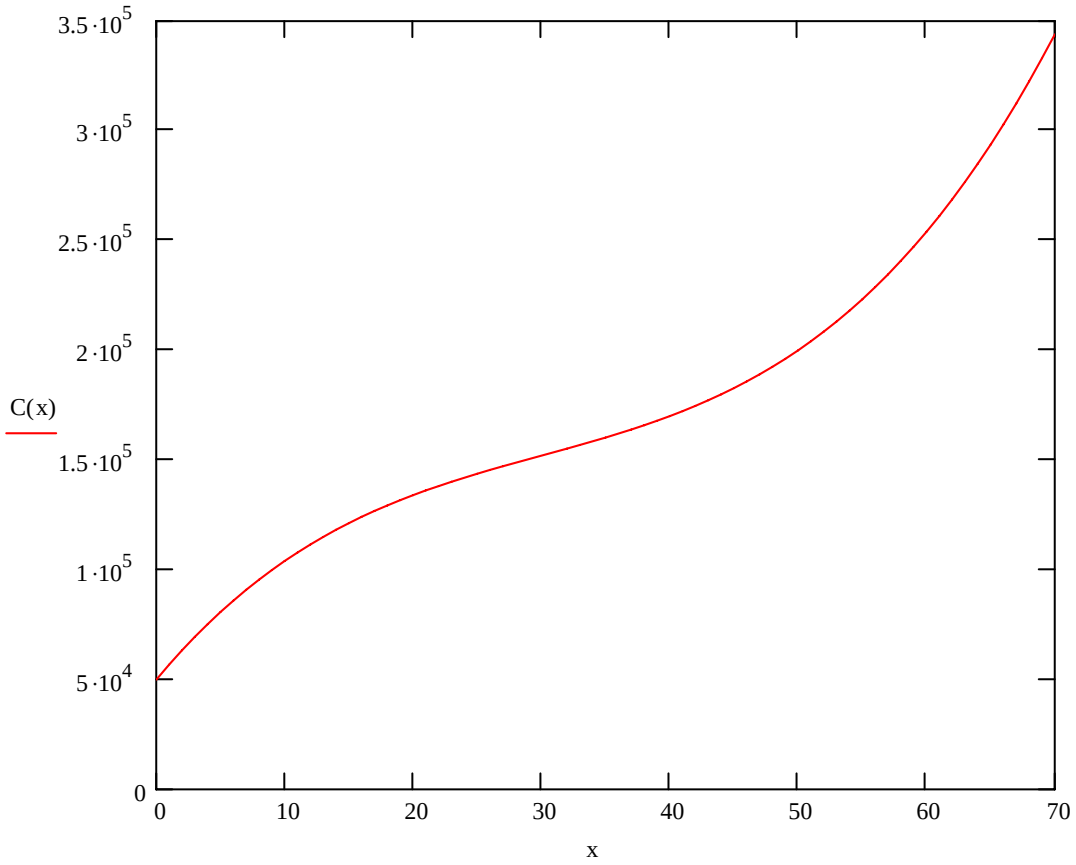
Assignment to 2.5





a25e01.mcd

Assignment to 2.5



5. Given are the following data:

$C_f := 2000$

$C_v(x) := 0.2x^2$

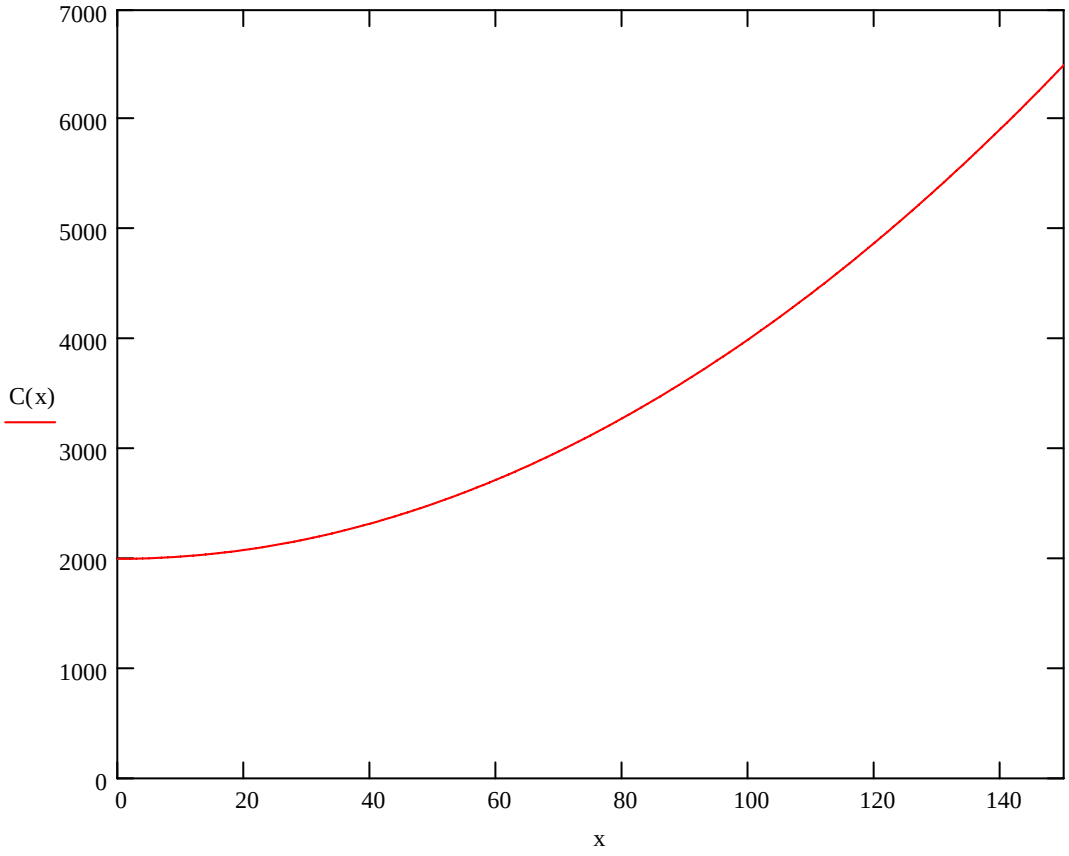
$C(x) := C_f + C_v(x)$

Which is the the value of c_v for $x_0 := 80$?

If $c_v(x_0)$ were regarded as a constant, what would the cost function look like? Use the following figure to draw this cost function.

$x := 0 .. 150$

Assignment to 2.5



6. Given are the following data:

$C_f := 2000$

$C_v(x) := 0.2x^2$

$C(x) := C_f + C_v(x)$

Which is the value of C' for $x_0 = 80$?

If C'(x_0) were regarded as a constant, what would the cost function look like? Use the following figure to draw this cost function.

$x := 0 .. 150$

Assignment to 2.5