

# Introduction to Functions Assignment

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## **FINANCIAL TASK**

Create a table of values for the current value of an international currency of your choice (i.e. USD for US dollars or € for EU Euros) in comparison to Canadian (CDN) dollars when the value of Canadian dollars rises by increments of 200.00\$ up to 1000.00\$. Don't forget your labels and units. (2 marks)

Create a function that would model this situation given that there is a commission fee of 10.00\$ Canadian to trade the currency. Don't forget to include the "let" statements. Don't forget to test your function. (4 marks)

Create the inverse function and explain what it means. (3 marks)

Sketch both functions. State the domain and range for both. (4 marks)

## **ENGINEERING DESIGN TASK**

Design a bridge that allows vehicular traffic to pass over the Meuse River which is 140 m wide. The banks on both sides are 30m high. The bridge must be designed so that sailboats measuring 15m in height must be able to pass under the bridge's arch. Use **functions** of your choice to illustrate the **road**, the **river** and the **arch of the bridge** from the perspective of a sailor on the river (in other words, a side view of the bridge). (5 marks)

State the domain and range of each function that you used. (3 marks)

As part of your tasks as an engineer, you must respect your budget. The following functions below illustrate costs associated with your design. Your design requires 12 tons of steel and 41 tons of re-enforced concrete. At the end of the construction, your bill for manual labour was 560,000\$. In each case, solve for the missing variable. (5 marks)

**Cost of re-enforced concrete:**  $C(t) = 0.45t + 0.02$

**Cost of steel:**  $C(t) = 1.51t + 0.05$

where  $C(t)$  is the cost in thousands of dollars as a function of tons of the desired material with delivery.

**Cost of Labour:**  $C(h) = 0.120h$

where  $C(h)$  is the cost in thousands of dollars as a function of hours,  $h$ , of manual labour.

## ART DESIGN TASK

Create an abstract piece of artwork using only the inverses of at least three parent functions of your choice (**excluding** the linear function). Include the parent functions. Use different colours for each parent/inverse pairing that you use. You may include the mirror (optional). (7 marks)

Include a black vertical line test to illustrate situations where the inverse is **NOT** a function. (2 marks)

Define the domain and range of each inverse function that you drew. (3 marks)