

Applying function notation

Thursday, 19 April 2018 9:23 pm

★ Work to be complete by the end of the teaching:

5F: Applying Function Notation 195 1 2 3 4 5 6 7

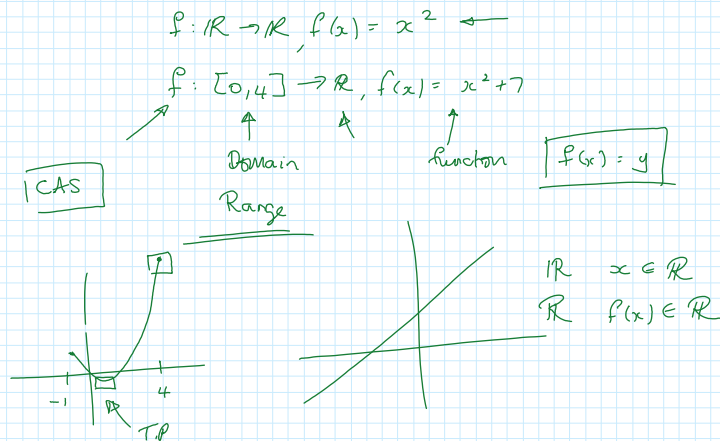
RECAP:

We have already talked extensively about functions. We have covered:

- What a function is
- How to write a function using function notation
- Domains
- Ranges
- Real Numbers and Integers
- Vertical line tests (to test for a function)
- How to restrict a function
- One to One functions, and
- Hybrid functions

The most important thing to recap is what $f(1)=7$ means.

$$\begin{aligned} f(x) &= y \\ \uparrow & \quad \uparrow \\ f(1) &= 7 \\ \hline (x, y) \\ (1, 7) \end{aligned}$$



This chapter is a review and pulls together the work from the first 4 chapter of the Methods 1 and 2 textbook

The questions look at finding things like:

- ✓ Practical domain
- ✓ Equations of lines given co-ordinates (which are expressed in function notation)

Example 1: Practical Domain

If, for example we look at the following formula, what do you think the "practical domain" is?

$$r \in [0, \infty)$$

$$V = \frac{4}{3}\pi r^3$$

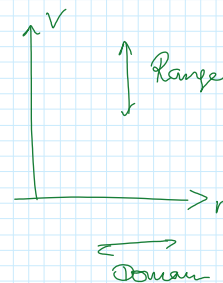
Volume of sphere

(r, V)

Radius

$(-\infty, \infty)$

$r = -4$



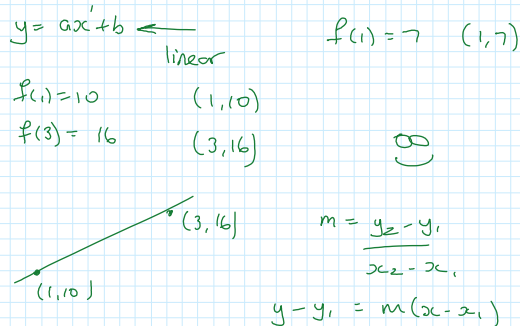
Example: Co-ordinates given in function notation

A question can give information in lots of different ways. Methods is as much a language as it is a science!

For example, imagine you have the following question, what information are they giving you and, more importantly, what thought processes do you need to have to solve the problem?

If $f: \mathbb{R} \rightarrow \mathbb{R}, f(x) = ax + b$ such that $f(1)=10$ and $f(3) = 16$, find a and b .

$$\begin{aligned} f & \uparrow \quad \uparrow \quad \uparrow \\ m &= \frac{16-10}{3-1} = \frac{6}{2} = \underline{\underline{3}} \\ a &= 3 \\ b &= 7 \\ y - y_1 &= m(x - x_1) \\ y - 10 &= 3(x - 1) \\ y - 10 &= 3x - 3 \\ y &= \underline{\underline{3x + 7}} \end{aligned}$$



- ① Equation ?
- linear
- quadratic
- cubic
- ② Coords ?
- ③ Solve

Example: Finding quadratic functions given co-ordinates in function notation

What about the chapter we have done on Quadratics?

How would the following question lead to the fact that you are being given really useful information?

Find the quadratic function f such that $f(3) = f(-5) = 0$ and $f(0) = -45$

$$\begin{aligned} f(3) &= 0 \\ f(-5) &= 0 \\ f(0) &= -45 \end{aligned}$$

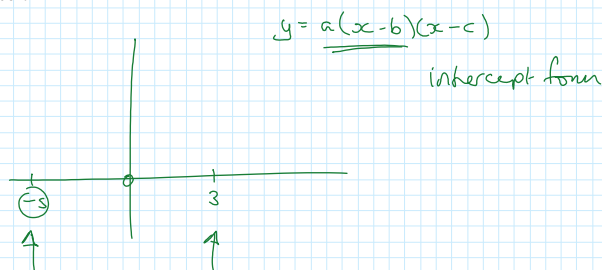
Intercept?

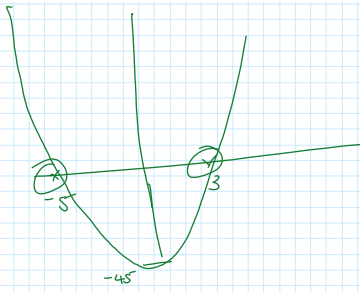
$(3, 0)$

$(-5, 0)$

$(0, -45)$

$y = 0$





$$\begin{aligned} \Rightarrow y &= a(x-b)(x-c) \\ y &= a(\overset{\checkmark}{x+5})(\overset{\checkmark}{x-3}) \quad (3) \\ -45 &= a(+5)(-3) \\ -45 &= a(-15) \\ a &= 3 \end{aligned}$$

$$y = \underline{\underline{3(x+5)(x-3)}}$$