

ACCELERATED MATHEMATICS UNITS MATH1017 AND MATH1021

Lab Sheet 8

This week you will be doing a supervised quiz on Simpson's Rule. There's only one thing you will need to know, namely that if `fx` is a functional expression representing $f(x)$, then `diff(fx, x)` gives $f'(x)$, e.g. try the following,

```
fx := x^3;  
fdashx := diff(fx, x);  
fdashdashx := diff(fx, x, x);  
fdashdashx := diff(fx, x$2);
```

Note that we cannot use the map syntax for functions today. AiM can't deal with the `D` operator. Observe that `diff(fx, x, x)` is equivalent to `diff(diff(fx, x), x)`. So after the functional expression, any arguments given are what `fx` is differentiated with respect to. So a fourth derivative w.r.t. x would have `x` four times (as 2nd to 5th arguments). To help you not miscount Maple provides the `$` operator, where `$n` following an expression duplicates that expression n times. So `x$4` is equivalent to `x,x,x,x`. Unfortunately, AiM won't allow you to use the `$` operator, so you won't be able to use that shorthand. You will need `diff` with 5 arguments in the quiz.

When you're ready, login to AM M1017 (Super) or AMe M1021 (Super) at the usual place

<http://aim03.curtin.edu.au>

Your password is the first 4 characters of your usual AiM password together with a 4 character "word" from your tutor, like last week, except this week's "word" is different from last week's. As with last week, if your usual password starts with `fred` and the "word" your tutor gives you is `boat`, then your super password would be

`fredboat`

Hints.

1. Relax. Take your time. If you take it steadily, it should take about 20 minutes to do the quiz. And if you run out of time it's not the end of the world.
2. **Read** the instructions in the quiz. And **read** the feedback if you get something wrong.
3. An **integer** is one of those \mathbb{Z} things, e.g. $\dots, -1, 1, 2, 3, \dots$
4. We say $f(x)$ is **bounded above** if there exists M such that $f(x) \leq M$ for all x .
5. We say $f(x)$ is **bounded below** if there exists M such that $f(x) \geq M$ for all x .
6. We say $f(x)$ is **bounded** if there exists M such that $f(x)$ is *bounded above* by M and *bounded below* by $-M$.