



Creating Interactive Web Pages With MathML

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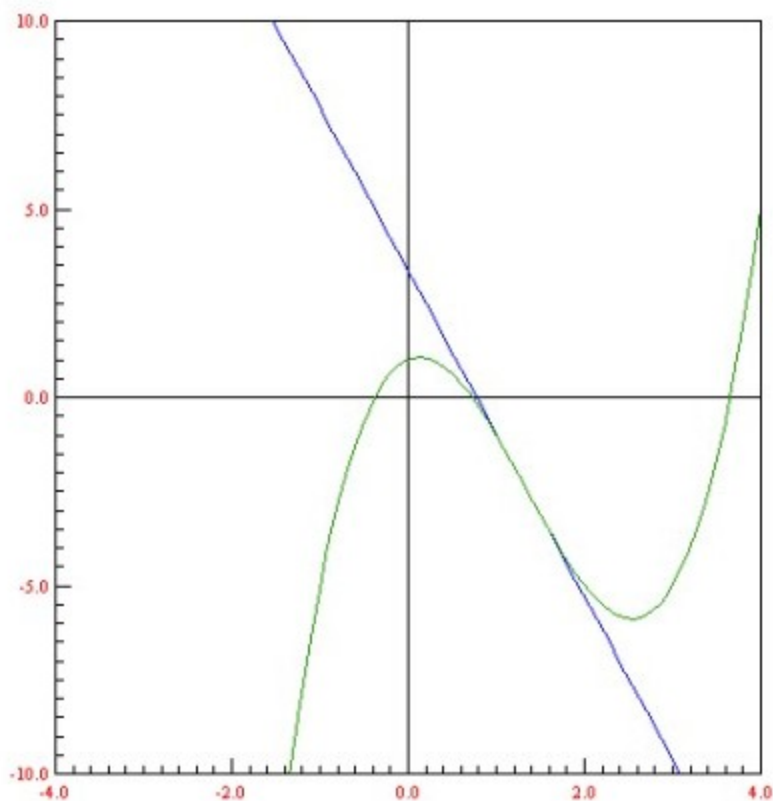
MathML

- From the "Math Activity Statement" of the W3C Math Working Group:
 - "Designed as an XML application, MathML provides two sets of tags, one for the *visual presentation* of mathematics and the other associated with *the meaning behind equations.*"
- More information at www.w3.org/math

The beauty of MathML

- MathML lends itself to
 - re-use
 - accessibility
 - manipulability
 - CSS and/or XSL
 - JavaScript
 - interactivity

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$$x = 1.29$$

$$y = -2.21$$

$$\text{slope} = -4.32$$

Increase/decrease value of x:

decrease

increase

Parametric Equations

Use the controls to enter and animate parametric equations of motion.

Start Motion

Stop Motion

Hide Equations

$$x(t) = \cos^3(t - 3)$$

$$y(t) = \sin^2(t - 2)$$



Putting MathML through its paces

- The **action** element
 - **actiontype** attribute is required; no default value
 - values (not exhaustive):
 - `actiontype="toggle" selection="positive-integer"`
 - `actiontype="statusline"`
 - `actiontype="tooltip"`
 - `actiontype="highlight" my:color="red" my:background="yellow"`
 - `actiontype="link" dsi:href="http://www.mypage.com"`
 - I suspect that's not **action** enough for some of you...

For the `actiontype="toggle"`, MathPlayer updates the selection attribute with each click, so JavaScript programmers can use it to determine which expression is currently showing.

Putting MathML through its paces

- The **action** element
- Scripting with JavaScript
 - Since MathML is text, it's easily manipulable.
 - Back to our previous example...

Scripting MathML

- Easiest way is to use pre-written modules:


```

<script src=
".../webeq35/3.5/scripts/library/wbq.js"></script>
<script src=
".../webeq35/3.5/scripts/library/wbq_eqn.js"></script>
<script src=
".../webeq35/3.5/scripts/library/wbq_controls.js"></script>
...
var myfunction = new Equation("<math><msup><mi>x</mi>...");
var deriv = new Equation("<math><mn>3</mn>...");

```

These are the lines of code from the previous interactive example. The "wbq.js", "wbq_eqn.js", and "wbq_controls.js" items are modules that are included in the WebEQ Solutions Library.

WebEQ Solutions Library

- Contains 21 templates & logic modules
 - Get equation from reader and...
 - Generate an equation and...
 - Display an equation...
 - Create quizzes
 - Step-by-step exposition of problems
- More live examples at
<http://www.dessci.com/en/products/webeq/interactive>

Σing it up...

- 3 ways to get math into web pages
- MathML's versatility
- MathML's interactive capabilities
- WebEQ's Solution Library

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