Worksheet 8

SI with Ian

Week of April 7th

Feel free to use notes and other resources, however, please do not use online calculators. Also if you are printing this worksheet out before hand (thank you) please wait to complete the worksheet until the SI session.

1 Session Problems and Agenda

1. Let x and y be two positive numbers such that $x + 2y = 50$ and $(x + 1)(y + 2)$ is a maximum.

2. We want to build a box whose base length is 6 times the base width and the box will enclose $20in^3$. The cost of the material of the sides is $\$3/in^2$ and the cost of the top and bottom is $\$15/in^2$. Determine the dimensions of the box that will minimize the cost.

3. We have a piece of cardboard that is $50cm$ by $20cm$ and we are going to cut the corners so that the cardboard will be folded into a box. Determine the height of the box that will give a max volume.

Find the linear approximation to the function at the given point

1 $f(x) = 3xe^{2x-10}$ at $x = 5$

2 $h(t) = t^4 - 6t^3 + 3t - 7$ at $t = -3$

3 Find the linear approximation to $g(z) = \sqrt[4]{z}$ at $z = 2$. Use the linear approximation to approximate the value of $\sqrt[4]{3}$ and $\sqrt[4]{10}$. Compare the approximated values to the exact values (use the error equation).