Estimating Limits Numerically Worksheet

1. Let $f(x) = \frac{3^x - 2^x}{x}$ and fill in the table below (round results to the 5th decimal place).

x	-0.1	-0.01	-0.001	0.001	0.01	0.1
$f(x)$						

Use the values of x given in the table to estimate (to the 4th decimal place) the value of

$$\lim_{x \to 0} \frac{3^x - 2^x}{x}$$

2. Let $g(x) = \frac{1 - \sin x}{x - \frac{\pi}{2}}$ and fill in the table below (be sure you're in radian mode and round results to the **6th** decimal place). (Note: $\frac{\pi}{2} \approx 1.570796$)

x	1.5	1.57	1.5707	1.5708	1.58	1.6
$g(x)$						

Now use the values in the table to estimate the value of

$$\lim_{x \to \pi/2} \frac{1 - \sin x}{x - \frac{\pi}{2}}$$

3. Use an appropriate table as in #'s 1 and 2 above to numerically estimate the following limit

$$\lim_{x \to 2} \frac{x^2 - 2x}{x^2 - x - 2}$$

4. Use an appropriate table as in #'s 1 and 2 above to numerically estimate the following limit

$$\lim_{x \to 0} \frac{e^x - 1 - x}{x^2}$$