HW #3 SELECTED SOLUTIONS

§1.3 #8 §2.1 #1-3

1.3 #8 In 3-decimal arithmetic, $1+\frac{5}{\epsilon}$, $2+\frac{5}{\epsilon}$, and $3+\frac{5}{\epsilon}$ all round to $\frac{5}{\epsilon} = 50{,}000$

$= 5.00 \times 10^4$. a_2 is computed by adding numbers of quite different magnitude and the "units" digit is lost with 3-decimal precision.

2.1 #1,3 straightforward

#2. a. $1 + x^2 + \frac{1}{2}x^4 + \frac{1}{6}x^6 = 1 + x^2\left(1 + x^2\left(\frac{1}{2} + \frac{1}{6}x^2\right)\right)$

b. $1 - \frac{1}{2}x^2 + \frac{1}{24}x^4 = 1 + x^2\left(-\frac{1}{2} + \frac{1}{24}x^2\right)$

Programming Assignment:

	-10	0	1	5
$f(x)$	$-30{,}002{,}001$	-1	-18	$234{,}126$
$g(x)$	9.09×10^{99}	1	101	$\approx 9.86076 \times 10^{69}$
$h(x)$	2.0672×10^{6}	-20	-20.627	$31{,}001$
$f'(x)$	$19{,}000{,}600$	0	-107	$-265{,}975$
$g'(x)$	$\approx -9.0992 \times 10^{200}$	1	5050	$\approx 1.9672 \times 10^{71}$
$h'(x)$	$\approx -1{,}247{,}010.365$	-1	≈ 3.2763	≈ 37909.27