Activity 1

1 (a) We used Expo markers as our unit length and wires to wrap around the disks so we could lay the markers next to the wires for measurements.

(b) $\pi_{best} = 3.183$

(c) $\delta\pi = \pi_{best}\sqrt{\left(\frac{\delta d}{d}\right)^2 + \left(\frac{\delta c}{c}\right)^2} = 0.039$

(d) $\pi_{measured} = 3.183 \pm 0.039$

(e) We used relatively large units and the wires are not perfectly flexible and can stretch.

(f) use better tools.

$\frac{\partial f}{\partial p} = \frac{q - pq}{(p+q)^2}$ $\frac{\partial f}{\partial q} = \frac{p - pq}{(p+q)^2}$

2. $\delta f = \frac{1}{p+q}\sqrt{(q-pq)^2(\delta p)^2 + (p-pq)^2(\delta q)^2}$