WRITE YOUR NAME:

MAC 2312 Quiz 1
Friday January 26th

Question 1. Evaluate the integral.

$$\int_{14}^{16} \left(\frac{x}{2} - 6\right)^5 dx$$

Try $u = \frac{x}{2} - 6 = \frac{1}{2}x - 6$

$\frac{du}{dx} = \frac{1}{2} \Rightarrow du = \frac{1}{2}dx$

$2du = dx$

If $x = 14$ then $u = \frac{14}{2} - 6 = 7 - 6 = 1$

If $x = 16$ then $u = \frac{16}{2} - 6 = 8 - 6 = 2$

$$\int_{x=14}^{x=16} \left(\frac{x}{2} - 6\right)^5 dx = \int_{u=1}^{u=2} u^5 \cdot 2du$$

$$= 2\int_1^2 u^5 du = 2\left[\frac{u^6}{6}\right]_{u=1}^{u=2} = \frac{2}{6}\left[u^6\right]_{u=1}^{u=2}$$

$$= \frac{1}{3}\left(2^6 - 1^6\right) = \frac{1}{3}(64 - 1) = \frac{63}{3} = \underline{21}$$

$2^3 = 8$
$2^4 = 16$
$2^5 = 32$
$2^6 = 64$