MATH 181 WORKSHEET 16 NAME:_____

(PLEASE PRINT LEGIBLY)

Reduce numerical results.

1. Consider each of the following. Find each (if possible – if not possible leave in integral form and explain why the answer cannot be obtained with the integration techniques we have learnt to date) :

A. The arclength of the curve formed by $y = \frac{x^3}{3}$ from $x = 0$ to $x = 2$

B. The arclength of the curve formed by $y = \frac{x^3}{6} + \frac{1}{2x}$ from $x = 1$ to $x = 3$

C. The arclength of the curve formed by $y = \frac{x^2}{4} - \frac{\ln(x)}{2}$ from $x = 1$ to $x = 2$

D. The arclength of the curve formed by $y = \ln(1 - x^2)$ from $x = 0$ to $x = 0.5$

E. The arclength of the curve formed by $x = y^{3/2}$ from $(1, 1)$ to $(27, 9)$

2. Consider each of the following. Find each (if possible – if not possible leave in integral form and explain why the answer cannot be obtained with the integration techniques we have learnt to date) :

A. The area of the surface formed by rotating the curve formed by $y = \frac{x^3}{3}$ from $x = 0$ to $x = 2$ around the x-axis.

B. The area of the surface formed by rotating the curve formed by $y = \frac{x^3}{6} + \frac{1}{2x}$ from $x = 1$ to $x = 3$ around the x-axis.

C. The area of the surface formed by rotating the curve formed by $y = x^{3/2}$ from $(1, 1)$ to $(9, 27)$ around the x-axis.

D. The area of the surface formed by rotating the curve formed by $y = x^{3/2}$ from $(1, 1)$ to $(9, 27)$ around the y-axis.

3. Consider each of the following. Find each (if possible – if not possible leave in integral form and explain why the answer cannot be obtained with the integration techniques we have learnt to date) :

A. The volume of the solid formed by rotating the region bounded by $y = \frac{x^3}{3}$, $x = 0$, $y = 0$, and $x = 2$ around the x-axis.

B. The volume of the solid formed by rotating the region bounded by $y = \frac{x^3}{3}$, $x = 0$, $y = 0$, and $x = 2$ around the y-axis.

C. The volume of the solid formed by rotating the region bounded by $y = \frac{x^3}{3}$, $x = 0$, $y = 0$, and $x = 2$ around the line $y = -2$.

D. The volume of the solid formed by rotating the region bounded by $y = \frac{x^3}{3}$, $x = 0$, $y = 0$, and $x = 2$ around the line $x = -4$.