If an answer does not exist write, "D.N.E.," in the answer blank and explain why it does not exist. Reduce numerical results.

1. Evaluate the following:

A. $\int \frac{2x-1}{\sqrt{9+x^2}}dx$

B. $\int \frac{2x-1}{x^2+9}dx$

C. $\int \sin^2(\omega)d\omega$

D. $\int \sin^3(\omega)d\omega$

E. $\int \frac{e^{3x}}{\sqrt{1-e^{6x}}}dx$

F. $\int \frac{2x}{(x^2+9)(x-1)}dx$

2. Find the volume of the solid formed by the region bounded by $y = \cos(x)$, $y = 0$, $x = \frac{\pi}{6}$, $x = \frac{\pi}{3}$ spun about the x-axis

3. Find the volume of the solid formed by the region bounded by $y = \cos(x)$, $y = 0$, $x = \frac{\pi}{6}$, $x = \frac{\pi}{3}$ spun about the y-axis

4. Evaluate the following:

A. $\int_3^\infty \frac{1}{x^2+9}dx$

B. $\int_1^\infty \frac{x^3}{x^2+9}dx$

C. $\int_0^\infty (e^{-x})dx$

D. $\int_0^\infty (xe^{-x})dx$

E. $\int_0^\infty (e^{-10x})dx$

5. Find the volume of the solid formed by the region bounded by $y = \frac{6}{\sqrt[3]{x^5}}$, $y = 0$, $x = 8$, to the right of $x = 8$ spun about the x-axis

6. Find the volume of the solid formed by the region bounded by $y = \frac{3}{\sqrt[11]{x^7}}$, $y = 0$, $x = 1$, to the right of $x = 1$ spun about the x-axis

7. Find the volume of the solid formed by the region bounded by $y = e^{-5x}$, $y = 0$, $x = 0$, to the right of $x = 0$ spun about the x-axis

8. Find an approximation for $\int_1^9 \frac{x^3}{x^2+9}dx$ using the trapezoid rule with n = 16 cuts (partition of the x-values 16 equal parts)

9. Find an approximation for $\int_1^9 \frac{x^3}{x^2+9}dx$ using Simpson's rule with n = 8 cuts (partition of the x-values 8 equal parts)

10. Find an approximation for $\int_1^9 \frac{x^3}{x^2+9}dx$ using the trapezoid rule with n = 400 cuts using Maple or Mathematica.