1) Find the following integrals.

a) $\int e^{5x}\ dx$

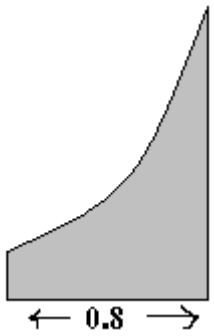
b) $\int \cos x \sin 5x\ dx$

c) $\int \frac{3x + 4}{x + 3}\ dx$

d) $\int \frac{2x + 5}{x^2 + 5x}\ dx$

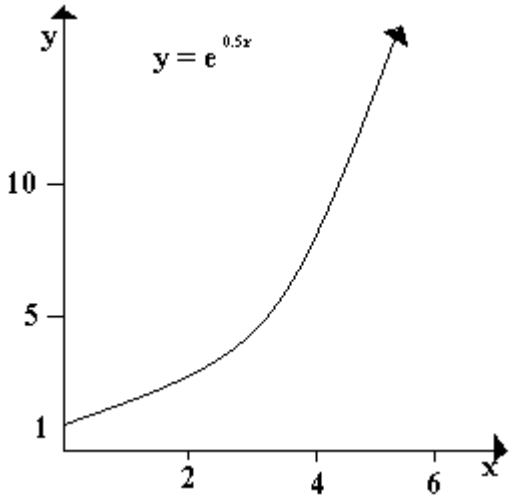
2) The diagram shows the shape of a metal component required in a manufacturing process…

The area required of the flat metal component is described by the area between the graph of $y = e^x \sin x$, the x axis, and the lines $x = 0.2$ and $x = 1.0$. Using a numerical method find a value for the area. Use and interval of 0.2.



(Sorry for poor image)

3) A company which produces earthenware wants to make a water container which will hold at least 400 mL of water.
The water container is modeled by rotating the area enclosed by the graph of $y = e^{0.5x}$ and the lines $x = 0$ and $x = 5$, about the x axis. x is in cm. Will this container hold at least 400 mL of water? Working and reasoning must be shown.



4) Evaluate $\int_0^{\pi} \cos x \, dx$

5) $\int_{-1}^{0} (2 - x)^4 \, dx$

6) A hemispherical bowl has an internal radius of 13 cm, and contains water to a maximum depth of 8cm. Find the volume of water in the bowl.