

1a)  $G(x) = \int_1^x e^{t^2} dt$ . Find  $G'(x)$ .

1b)  $G(x) = \int_x^1 e^{t^2} dt$ . Find  $G'(x)$ .

1c)  $G(x) = \int_1^{x^2} e^{t^2} dt$ . Find  $G'(x)$ .

2) A particle moving along a straight line has its position function given by  $y(t) = 4 + \int_1^t (x^2 - 5)e^x dx$ , where  $y$  is in meters when  $t$  is in seconds.

a) Where is the particle at  $t = 1$  s?

b) Determine what time(s), if any, this particle reverses direction.

3) Evaluate the following:

a)  $\int e^x \cos(e^x) dx$

b)  $\int_0^1 x \sqrt{1-x^4} dx$ . Hint: as you did on a homework problem, make a substitution and interpret the resulting integral in terms of an area. If you don't have a graphing calculator, check with instructor if you would like to see a graph.

4) Consider the two shaded areas  $A$  and  $B$  shown in the figure. Prove that  $A$  equals  $B$ . Note: you are not required to evaluate any integrals.

