Mathematics exercises for exam preparation:
A. Integrals; B. Calculation of Area

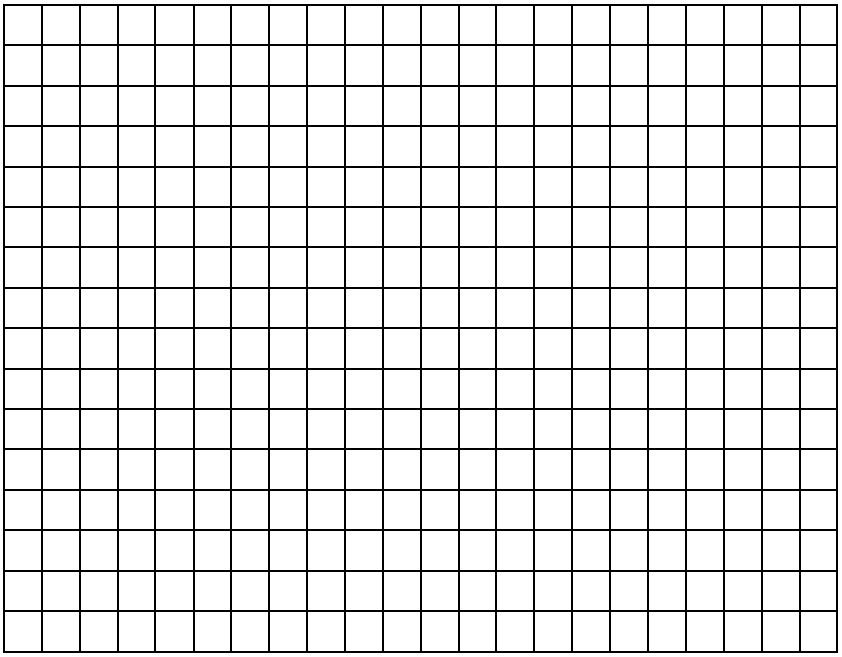
A. Evaluate the following integrals.

1. $\int e^{\frac{x}{2}}\,dx =$
2. $\int 5^{x}\,dx =$
3. $\int e^{-3}\,dx =$
4. $\int e^{x^3}x^2\,dx =$
5. $\int \frac{\sin x}{(\cos x)^3}\,dx =$
6. $\int \sqrt[3]{5-6x}\;dx =$
7. $\int \cos\frac{x}{4}\,dx =$
8. $\int \sin x\,(\cos x)^3\,dx =$
9. $\int \frac{dx}{x\,(1+\ln x)}\,dx =$
10. $\int \frac{dx}{(\arcsin x)^2\sqrt{1-x^2}} =$
11. $\int x\sin x\;dx =$
12. $\int x^2\cos x\;dx =$
13. $\int xe^{x}\,dx =$

B. Calculation of Area.

1.

a) Sketch the area of the region enclosed by the curves of $f(x) = \frac{x^2}{2}$ and $g(x) = \frac{1}{2} - \frac{x}{2}$.



b) Find the area of the region enclosed by the curves of $f(x) = \frac{x^2}{2}$ and $g(x) = \frac{1}{2} - \frac{x}{2}$.

3. Draw the function $f(x) = e^{2t+1}$ on the interval [-1;1] and evaluate the integral.

$$\int_{-1}^{1} e^{2t+1} dt$$