Evaluate the following

1. $\displaystyle\int \cos(5x)\sin(5x)\sin(\sin(5x))\ dx$

2. $\displaystyle\int \arctan(x)\ dx$

3. $\displaystyle\int_{-5}^{5} \arctan(x)x^4\ dx$

4. $\displaystyle\int e^x \cos(x)\ dx$ Hint: Try parts twice and be careful with your signs

5. $\displaystyle\int_{0}^{\pi} \sin(x^2)\ dx$