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**Spring Break homework** - MAC 2312, Spring 2016

1. Earlier in the course we mentioned that the integral

$$\int \sqrt{1-x^2} dx$$

is not easy to compute. Using a trig substitution, now you can compute it. Do so!

2. The integrals below are important in electrical engineering. Compute them (assume that  $b$  is a given constant).

(a)  $\int \frac{x}{(x^2+b^2)^{3/2}} dx$

(b)  $\int \frac{1}{(x^2+b^2)^{3/2}} dx$

*Hint:* For one integral you need a trig substitution. The other can be done much faster.

3. Use partial fractions to compute the integrals

(a)  $\int \frac{x^3}{x^2-4} dx$

(b)  $\int \frac{1}{x^3+4x} dx$

*Note:* Each integral can be also done with an appropriate trig substitution. You will receive one additional point (and check your previous work) if you compute them both ways.