> Answer the questions below. You may answer in the space provided. You may use the back or a separate sheet of paper if you need more space. You are to work in groups of no more than four people. Make sure to enter the names of your groupmates below.

Name: _____

Section: _____

Group Members: _____

1. A continuous random variable X has a density function of

$$f(x) = \begin{cases} \frac{\alpha}{1+x^2}, & x > 0 \\ 0, & x \leq 0. \end{cases}$$

   (a) (2 points) Find α.

   (b) (3 points) Find $E[X]$.

2. Suppose the heights of twenty-year-old men is normally distributed with a mean of 176.8 centimeters and a standard deviation of 7.2 centimeters.

   (a) (4 points) Find the probability that a twenty-year-old man chosen at random has a height between 165 centimeters and 180 centimeters. Make sure to find the standard scores for the endpoints of the interval and draw a graph of a bell curve indicating the probability and the z and X values. Round your answer to four decimal places.

   (b) (2 points) What is the probability that the height of a twenty-year-old-man is 176.8 centimeters?