1 Mandatory part

This part of the hometask is graded.

1. The height of a randomly selected person is normally distributed with expected value of 170 cm, and standard deviation of 5 cm.

   (a) Find the median height, the modal height.

   (b) What is the probability that a randomly chosen person will be taller than 180 cm? Lower than 165 cm? Between 165 cm and 190 cm?

2 Optional part

This part of the hometask is just for fun.

1. The law of distribution of a random variable X is given in the table

Value of X	0	1	-2
Probability	0.2	0.3	0.5

   (a) Find $\mathbb{E}(X)$, $\mathbb{E}(X^2)$, $\mathbb{E}(5X + 10)$, $\mathbb{V}\mathrm{ar}(X)$, $\mathbb{E}(X^3)$

   (b) Find the mode of the random variable X

2. James Bond tests a top secret hypothesis H_0 against even more secret alternative hypothesis H_a at $\alpha = 0.1$ significance level. The P-value is equal to 0.085. Should James reject the null-hypothesis?