

## Problem 1

### Part A

Once can say with high confidence that the true mean of sleep is under 8 hours since the entire confidence interval of 95% confidence lies under 8.

### Part B

The confidence interval would get narrower.

### Part C

The confidence interval would get wider.

## Problem 2

### Part A

It follows an approximate normal distribution.

### Part B

The confidence interval will be of the form  $\hat{\mu} \pm t^* \cdot \frac{\hat{\sigma}}{\sqrt{n}}$  where  $\hat{\mu} = 6.32$ ,  $\hat{\sigma} = 1.65$ ,  $t^* = 0.95$ , and  $n = 50$ , resulting an interval  
(5.851, 6.789).

### Part C

We can say with 95% confidence that the true average adaptation time for a robotic lens lies between 5.851 and 6.789 seconds.

## Problem 3

### Part A

The confidence interval will be of the form  $\hat{p} \pm t^* \cdot \sqrt{\frac{p(1-p)}{n}}$  where  $\hat{p} = 0.55$ ,  $n = 1000$ , and  $t^* = 2.576$ , resulting an interval  
(0.5095, 0.5905).

### Part B

We can say with 99% confidence that the true average proportion of all voters that will answer yes to if they support the governments foreign policy is between 0.5095 and 0.5905.