Quiz 5

Name:

Remember to state the logic behind your answers.

1. Suppose that $x_1, \ldots, x_n$ are independent and identically distributed observations from a normal distribution with mean 10 and variance 4. What is the distribution of $\bar{x}$ for $n = 10$?

2. Suppose that we measure want to compare a new flu treatment to the traditional treatment. The average recovery time for the traditional treatment is 4 days. To test the new treatment you give it to 50 people and obtain an average recovery time of 2.8 days with a standard deviation of 1.9 days.

   a. What is the standard error of the mean?

   b. Construct a 95% confidence interval for the mean recovery time of the new treatment.

   c. Approximately what sample size would you need to obtain a margin of error of 0.5?

Standard normal table

```
##   alpha        z
## 1  0.10 1.644854
## 2  0.05 1.959964
## 3  0.01 2.575829
```

t table

```
##    alpha df        t
## 1   0.10  2 2.919986
## 2   0.05  2 4.302653
## 3   0.01  2 9.924843
## 4   0.10  3 2.353363
## 5   0.05  3 3.182446
## 6   0.01  3 5.840909
## 7   0.10  4 2.131847
## 8   0.05  4 2.776445
## 9   0.01  4 4.604095
## 10  0.10  5 2.015048
## 11  0.05  5 2.570582
## 12  0.01  5 4.032143
## 13  0.10  6 1.943180
## 14  0.05  6 2.446912
## 15  0.01  6 3.707428
## 16  0.10  7 1.894579
## 17  0.05  7 2.364624
## 18  0.01  7 3.499483
## 19  0.10  8 1.859548
## 20  0.05  8 2.306004
## 21  0.01  8 3.355387
## 22  0.10  9 1.833113
## 23  0.05  9 2.262157
## 24  0.01  9 3.249836
## 25  0.10 10 1.812461
## 26  0.05 10 2.228139
## 27  0.01 10 3.169273
```