Quiz Review

Problems

Exercise 1.

Colleges and universities are requiring an increasing amount of information about applicants before making acceptance and financial aid decisions. Select all the variables below which are quantitative.

- ☐ High school GPA
- ☐ Country of citizenship
- ☐ Applicant's score on the SAT or ACT
- ☐ Gender of applicant
- ☐ Parents' income
- ☐ Age of applicant

Solution:

- ☒ High school GPA
- ☐ Country of citizenship
- ☒ Applicant's score on the SAT or ACT
- ☐ Gender of applicant
- ☒ Parents' income
- ☒ Age of applicant

Exercise 2.

Use R to calculate the mean, variance, standard deviation of the following data table. The table below gives the number of shafts buried at each of 13 recently discovered gravesites.

```
1, 2, 3, 1, 5, 6, 2, 4, 1, 2, 4, 2, 9
```

Hint: Please creat a vector in R with the values above, use `mean()`, `var()`, `sd()` to find the mean, variance, and standard deviation, respectively.

Solution:

```
x <- c(1, 2, 3, 1, 5, 6, 2, 4, 1, 2, 4, 2, 9)
mean(x)
```

```
[1] 3.230769
```

```r
var(x)
```

```
[1] 5.525641
```

```r
sd(x)
```

```
[1] 2.350668
```

Exercise 3.

Given that the random variable z has the standard normal probability distribution, write the R code is correct in finding the following probability $\Pr(z >= -1)$.

Solution:

```r
1 - pnorm(-1, 0, 1)
```

```
[1] 0.8413447
```

or

```r
pnorm(-1, lower.tail = FALSE)
```

```
[1] 0.8413447
```

Exercise 4.

Given that the random variable z has the standard normal probability distribution, write the R code in finding the following probability $\Pr(-1.96 <= z <= 1.96)$.

Solution:

```r
pnorm(1.96, 0, 1) - pnorm(-1.96, 0, 1)
```

```
[1] 0.9500042
```

Exercise 5.

Given that the random variable y has a normal probability distribution with mean 100 and variance 64, write the R code in finding the following probability $\Pr(y <= 92)$.

Solution:

```r
pnorm(92, 100, 8)
```

```
[1] 0.1586553
```

or

Exercise 6.

Given that the random variable y has a normal probability distribution with mean 100 and variance 64, write the R code in finding the following probability $\Pr(76 <= y <= 124)$.

Solution:

```
pnorm(124, 100, 8) - pnorm(76, 100, 8)
```

```
[1] 0.9973002
```