Midterm2

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Problem 1

To find the missing probability, we add up all the `P(x)` that are available and subtract the sum by 1. Because if we had all the probabilities they would add up to 1.

```
1 - (.22 + .18 + .16 + .13)
```

```
[1] 0.31
```

The missing `P(x)` is 0.31

Problem 2

```
x <- c(-2, 5, 7, 8, 12)
Probabilities <- c(.22, .18, .16, .31, .13)



Expected_value <- sum(x * Probabilities)
Expected_value
```

```
[1] 5.62
```

The expected value is 5.62

Problem 3

This is means that if we do the experiment multiple times the average result of `x` in the experiment would be approximately 5.62

Problem 4

```
variance <- sum((x - Expected_value)^2 * Probabilities)
variance
```

```
[1] 20.1956
```

```
standard_deviation <- sqrt(variance)
standard_deviation
```

```
[1] 4.493951
```

Both variance and standard deviation measure the variability (or spread) of random variables

From my computations the `Standard Deviation` of 4.50 suggests that the on average the values are approximately 4.50 units away from the `Mean(Expected Value)` of 5.62. And `Variance` is the `Square` of `Standard Deviation`.