[A] Circle whether each statement is true or false. Assume equal signs represent ≈ for rounded values.

T F   1. $\sigma_{\bar{x}} > \sigma$.

T F   2. $P(z < 1) = 84\%$

T F   3. $P(-1.28 < x < 1.28) = 80\%$

T F   4. Given $\mu = 30$ and $\sigma = 4$, $P(z < 34) = 84\%$

T F   5. $P(-0.71 < z < 1.19) = P(z < 1.19) - P(z > -0.71)$

T F   6. Die rolls are approximately normally distributed.

T F   7. The score needed to be in the top 30% is the 30th percentile.

T F   8. 95% of the area under the normal curve is between $z = -1.96$ and $z = 1.96$.

T F   9. Averages of 30 dice rolled at a time are approximately normally distributed.

T F   10. Given $\mu = 30$ and $\sigma = 7$, a raw score of 39 has a z-score of $z = \frac{39 - 30}{7} = 1.28 = 90\%$.

T F   11. A z-score of -2.31 represents a value that is 2.31 standard deviations below the mean.

T F   12. In California, a Trump approval rating above 50% is more likely in a random sample of 40 people than in a random sample of 80 people.

[B] For each problem, find the stated value, shade the percentage given in the problem or the percentage representing the answer, label each boundary of the shaded area with its z score, and write an equation showing a probability as equal to the size of the shaded area.
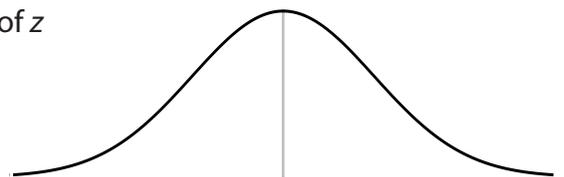
1. $P(x > 40)$, given $\mu = 50$ and $\sigma = 10$
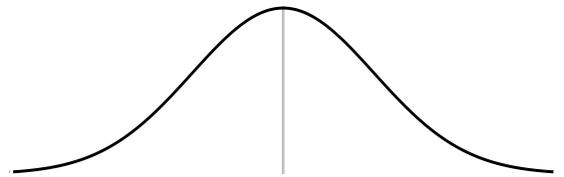
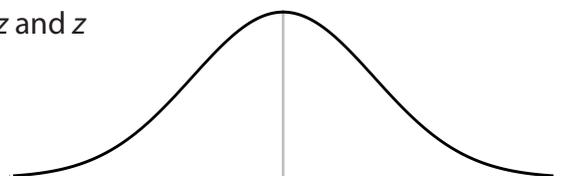2. $P(\bar{x} > 40)$, given $\mu = 50$, $\sigma = 10$, and $n = 4$
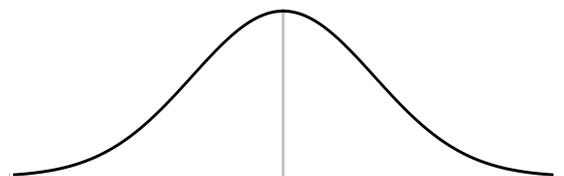
3.   z, given 95% of the area under the normal curve lies to the left of z

4.   z, given 90% of the area under the normal curve lies between -z and z

[C] A Stanford study in 2017 found that Americans average 4774 steps per day. Assume the standard deviation is 1800 steps. Svea gets daily averages from a random sample of 25 Americans.

1. What is the probability that the average of her sample will be between 5000 and 6000 steps per day?

The shaded area is the percentage given in the problem or the percentage representing the answer. ____
Each boundary of the shaded area is labeled with its z score. ____
Every step is shown in the work, including values from the normal table. ____
Only equations are shown in the work. ____
x, $\bar{x}$, or z is in every equation. ____
The work concludes with an equation relating x or $\bar{x}$ to the percentage of the curve that is shaded. ____
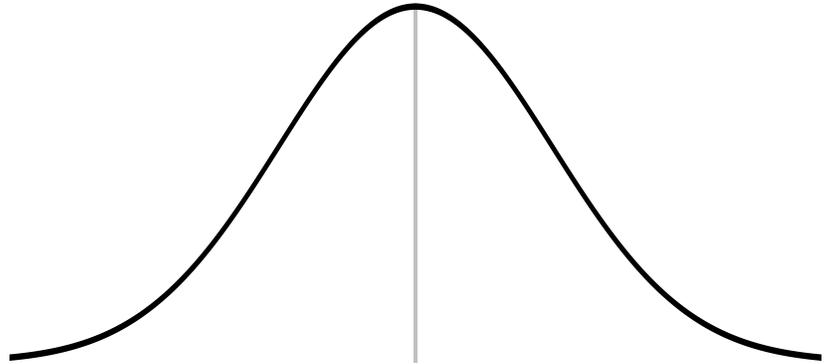
2. Give the range that is centered about 4774 and that has an 80% chance of including the average of Svea's sample.

The shaded area is the percentage given in the problem or the percentage representing the answer. ____
Each boundary of the shaded area is labeled with its z score. ____
Every step is shown in the work, including values from the normal table. ____
Only equations are shown in the work. ____
x, $\bar{x}$, or z is in every equation. ____
The work concludes with an equation relating x or $\bar{x}$ to the percentage of the curve that is shaded. ____
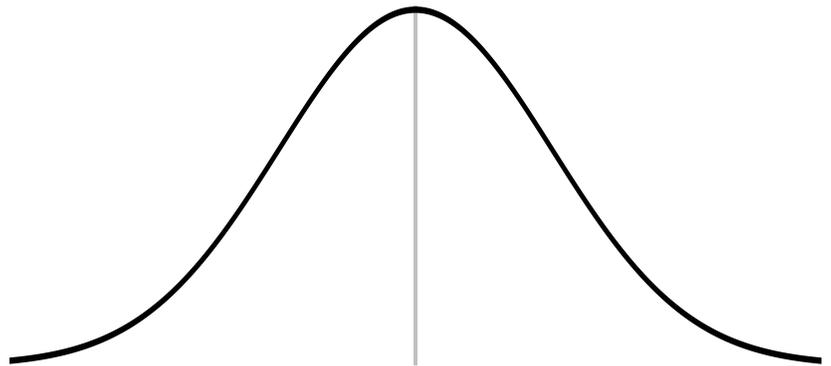
[D] Optional. A confidence interval is a range, centered about the sample mean, that has a specified probability of including the population mean.

1. Kayla measures the speeds of 30 cars on Scotts Valley Drive and finds an average speed of 38 mph with standard deviation 6.5 mph. Calculate a 90% confidence interval.