

Z scores, probability, and the normal distribution

1. If a population distribution has a mean of 40 with a standard deviation of 7, what would the z score be if $x = 42$?
2. If a sample distribution has a z score of -2.4, with a mean of 4 and a standard deviation of 1.5, what would x equal?
3. If Stan is 2 standard deviations above the mean, and the mean is 10 with a standard deviation of 4, what is Stan's z score? What would Stan's z score be if the mean was 10 but the standard deviation was 6?
4. For question #1, assuming a normal distribution, calculate the probability of scoring 42 or higher? What is the probability of scoring 42 or lower?
5. If a sample has a mean of 100 with a standard deviation of 20, assuming a normal distribution, what is the probability of scoring 70 or more?
6. If a population has a mean of 20, with a standard deviation of 5, what is the probability of scoring 15 or less?

answers:

1. $z = .29$
2. $x = .4$
3. Stan's z score is 2 if he is 2 standard deviations above the mean, regardless of what the standard deviation equals.
4. If $z = +.29$, then $p = .3859$ of scoring 42 or higher and $p = .6141$ of scoring 42 or lower.
5. $p = .9332$ of scoring 70 or more
6. $p = .1587$ of scoring 15 or less.