

Sections 5.3 and 5.4 Extra Examples

1. An experiment consists of rolling a die 60 times. If the random variable X is defined as the number of times the die shows a number larger than 4:
What is the expected value of X ? What is the standard deviation?
2. An experiment consists of rolling a pair of dice 60 times. If the random variable X is defined as the number of times the dice produce a sum larger than 9:
What is the expected value of X ? What is the standard deviation?
3. The weight of Rainbow Trout is normally distributed with a mean weight of 3.6 pounds and a standard deviation of 0.75 pounds. Find the probability that a randomly selected rainbow trout weighs 2.3 pounds or more. Give your answer as a decimal number correct to three decimal places.
4. Let X be a normal random variable with mean 400 and standard deviation 40.
Find $\Pr[360 < X < 410]$. Give answer as a decimal number correct to three decimal places
5. Assume that IQ scores are normally distributed with mean 100 and standard deviation 15. What is the probability that a randomly chosen person will have an IQ less than 105?
Enter your answer as a decimal number correct to three decimal places.
6. An unfair coin with $\Pr[\text{Heads}] = 0.65$ is flipped 400 times. Find the standard deviation for the number of heads. Give your answer with three decimal places.
7. Two coins are selected at random from a pocket that contains 2 nickels and 6 quarters. The random variable X is the total value in cents of the 2 selected coins. Find $E(X)$.
8. A piggy bank containing 1,000 unfair coins is dumped onto a table. The probability of tails is 0.75 on every coin. Let the random variable X be the number of heads that appear. Find the expected value of X .
9. An unfair coin with $\Pr[\text{Heads}] = 0.65$ is flipped 300 times.
Find the expected number of tails, and find standard deviation. Express your answer with three decimal places.
10. Using the standard normal probability table, find $P [Z > 0.1]$.
Enter your answer as a decimal number correct to three decimal places.
11. In a carnival game the probability that you win \$100 is 0.02, the probability that you win \$10 is 0.20, and the probability that you lose \$5 is 0.4. What is your expected return per game? (i.e. find the expected value)
12. ** Assume that IQ scores are normally distributed with a mean of 100 and a standard deviation of 15. What IQ score (to the nearest whole number) does 30% of the population exceed?
(See problems #7 and #11 in section 5.4, yes 5.4)