

Chapter 6 FRAPPY!

Sample 1

Directions: Show all your work. Indicate clearly the methods you use, because you will be scored on the correctness of your methods as well as on the accuracy and completeness of your results and explanations.

Buckley Farms produces homemade potato chips that it sells in bags labeled "16 ounces." The total weight of each bag follows an approximately Normal distribution with a mean of 16.15 ounces and a standard deviation of 0.12 ounces.

(a) If you randomly selected 1 bag of these chips, what is the probability that the total weight is less than 16 ounces?

$$\begin{aligned} & \text{normalcdf}(\text{lower} = -9999, \text{upper} = 16, \\ & \quad \text{mean} = 16.15, \text{SD} = 0.12) \\ & = 0.1057 \end{aligned}$$

(b) If you randomly selected 10 bags of these chips, what is the probability that exactly 2 of the bags will have a total weight less than 16 ounces?

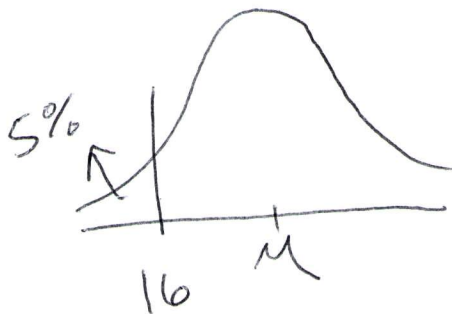
$$\begin{aligned} & \text{binompdf}(n = 10, p = 0.1057, x\text{value} = 2) \\ & = .2057 \end{aligned}$$

(c) Buckley Farms ships its chips in boxes that contain 6 bags. The empty boxes have a mean weight of 10 ounces and a standard deviation of 0.05 ounces. Calculate the mean and standard deviation of the total weight of a box containing 6 bags of chips.

$$\text{Mean} = 106.9 \text{ ounces}$$

$$\begin{aligned} \text{SD} &= \sqrt{0.05^2 + 0.12^2 + 0.12^2 + 0.12^2 + 0.12^2 + 0.12^2 + 0.12^2} \\ &= 0.298 \text{ ounces} \end{aligned}$$

(d) Buckley Farms decides to increase the mean weight of each bag of chips so that only 5% of the bags have weights that are less than 16 ounces. Assuming that the standard deviation remains 0.12 ounces, what mean weight should Buckley Farms use?



$$1.645 = \frac{16 - \mu}{0.12}$$

$$0.1974 = 16 - \mu$$

$$15.8026 = \mu$$

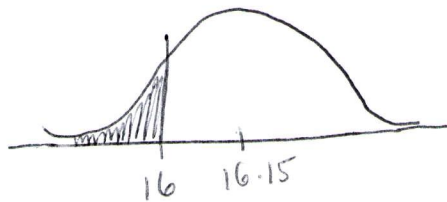
Chapter 6 FRAPPY!

Sample 2

Directions: Show all your work. Indicate clearly the methods you use, because you will be scored on the correctness of your methods as well as on the accuracy and completeness of your results and explanations.

Buckley Farms produces homemade potato chips that it sells in bags labeled "16 ounces." The total weight of each bag follows an approximately Normal distribution with a mean of 16.15 ounces and a standard deviation of 0.12 ounces.

- (a) If you randomly selected 1 bag of these chips, what is the probability that the total weight is less than 16 ounces?



$$Z = \frac{16 - 16.15}{0.12} = -1.25$$

$$\rightarrow .1057$$

- (b) If you randomly selected 10 bags of these chips, what is the probability that exactly 2 of the bags will have a total weight less than 16 ounces?

$$(.1057)^2 (1 - .1057)^8 = 0.004571$$

(c) Buckley Farms ships its chips in boxes that contain 6 bags. The empty boxes have a mean weight of 10 ounces and a standard deviation of 0.05 ounces. Calculate the mean and standard deviation of the total weight of a box containing 6 bags of chips.

$$\text{mean} = 10 + \underbrace{16.15 + \dots + 16.15}_{6 \text{ times}} = 106.9 \text{ ounces}$$

$$\text{SD} = 0.05 + \underbrace{0.12 + \dots + 0.12}_{6 \text{ times}} = 0.77 \text{ ounces}$$

(d) Buckley Farms decides to increase the mean weight of each bag of chips so that only 5% of the bags have weights that are less than 16 ounces. Assuming that the standard deviation remains 0.12 ounces, what mean weight should Buckley Farms use?

$$.05 = \frac{X - 16}{.12}$$

$$\begin{array}{r} .006 = X - 16 \\ + 16 \quad \quad + 16 \\ \hline \end{array}$$

$$16.006 = X$$