

An Example of Discrete Probability

Ex: Each week 1000 lottery tickets are sold for \$1 each. Fifteen (15) tickets are \$20 winners, 5 are \$50 winners, 2 are \$100 winners, and 1 is a \$300 winner. If you buy 1 ticket, what is your expected net monetary outcome?

Let random variable x be your net gain (\$). Then

<u>x (\$)</u>	<u>$P(x)$</u>
-1	$977/1000$
19	$15/1000$
49	$5/1000$
99	$2/1000$
299	$1/1000$

$$\begin{aligned}\mu = E(x) &= (-1)\left(\frac{977}{1000}\right) + (19)\left(\frac{15}{1000}\right) \\ &+ (49)\left(\frac{5}{1000}\right) + (99)\left(\frac{2}{1000}\right) + (299)\left(\frac{1}{1000}\right) \\ &= \$\frac{50}{1000} = \$\frac{1}{20} = \text{\textcircled{5¢}}\end{aligned}$$