

objective:  
compute expected value

Turn in Statistics Chapter 4  
Probability Practice AND The  
chapter 3-4 Review. Grades dropped  
because these went in as zeros if  
you did not turn them in.



Bear Creek is having a raffle for a free I phone. Each raffle ticket cost \$1. The phone is valued at \$280 and was donated to the school. We sold 1200 tickets.

a) you bought 20 tickets. What is the probability that you will win the I phone? What is the probability that you will not win the I phone?  
pull:  $P(\text{win}) = 20/1200$   $P(\text{not win}) = 1180/1200$

b) Your expected earnings can be found by multiplying the value of the I phone times the probability that you will win the I phone. Find your expected earnings.

expected earnings = (probability you win)(value of the prize)

$$\text{pull: } \frac{20}{1200}(280) = \$4.67$$

c) Your expected contribution =  
amount of money you spent - your expected earnings.

expected contribution = amount spent - expected earnings

$$\text{pull: spent } \$20 - 4.67 = 15.33$$

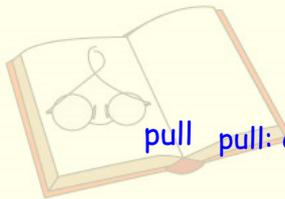
12.

**Spring Break: Caribbean Cruise** The college student senate is sponsoring a spring break Caribbean cruise raffle. The proceeds are to be donated to the Samaritan Center for the Homeless. A local travel agency donated the cruise, valued at \$2000. The students sold 2852 raffle tickets at \$5 per ticket.

- (a) Kevin bought six tickets. What is the probability that Kevin will win the spring break cruise to the Caribbean? What is the probability that Kevin will not win the cruise?
- (b) Expected earnings can be found by multiplying the value of the cruise by the probability that Kevin will win. What are Kevin's expected earnings? Is this more or less than the amount Kevin paid for the six tickets? How much did Kevin effectively contribute to the Samaritan Center for the Homeless?

pull  $p(\text{win}) = 6/2852$

$p(\text{lose}) = \frac{2852-6}{2852}$



pull  $2846/2852$  ←  $p(\text{Kevin lose})$

pull pull: expected earnings =  $P(\text{win}) \times \text{value of prize}$

pull:  $6/2852 (2000) = \$4.21$

pull: expected loss = amount spent - expected earnings

pull:  $6(5) - 4.21 = \$25.79$

13. Open note quiz tomorrow. I will do this one, you will do another one like this with your notes. Write out the details so you will be able to follow.

**Expected Value: Life Insurance** Jim is a 60-year-old Anglo male in reasonably good health. He wants to take out a \$50,000 term (that is, straight death benefit) life insurance policy until he is 65. The policy will expire on his 65th birthday. The probability of death in a given year is provided by the Vital Statistics Section of the *Statistical Abstract of the United States* (116th Edition).

x = age	60	61	62	63	64
P(death at this age)	0.01191	0.01292	0.01396	0.01503	0.01613

Jim is applying to Big Rock Insurance Company for his term insurance policy.

- (a) What is the probability that Jim will die in his 60th year? Using this probability and the \$50,000 death benefit, what is the expected loss to Big Rock Insurance?
- (b) Repeat part (a) for years 61, 62, 63, and 64. What would be the total expected loss to Big Rock Insurance over the years 60 through 64?
- (c) If Big Rock Insurance wants to make a profit of \$700 above the expected total loss paid out for Jim's death, how much should it charge for the policy?
- (d) If Big Rock Insurance Company charges \$5000 for the policy, how much profit does the company expect to make?

pull a)  $P(\text{death}60) = (.01191)(50000) = 595.50$

pull  $P(\text{death}61) = (.01292)(50000) = 646$

pull  $P(\text{death}62) = (.01396)(50000) = 698$

pull  $P(\text{death}63) = (.01503)(50000) = 751.50$

pull  $P(\text{death}64) = (.01613)(50000) = 806.50$

pull Total 3497.50

pull c)  $3497.50 + 700 = 4197.50$

pull  $5000 - 3497.50 = 1,502.50$

## Assignment: p. 226 #1, 4, 6, 10,11.

#1. Which of the following are continuous variables and which are discrete?

- a) Number of traffic fatalities per year
- b) Distance a golf ball travels after being hit with a driver
- c) Time required to drive from home to college on any given day
- d) Number of ships in Pearl Harbor on any given day
- e) Your weight before breakfast each morning

