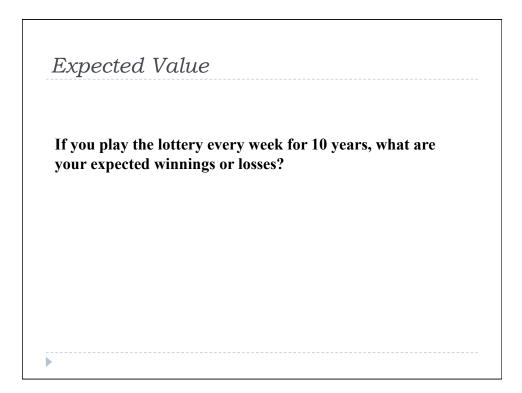
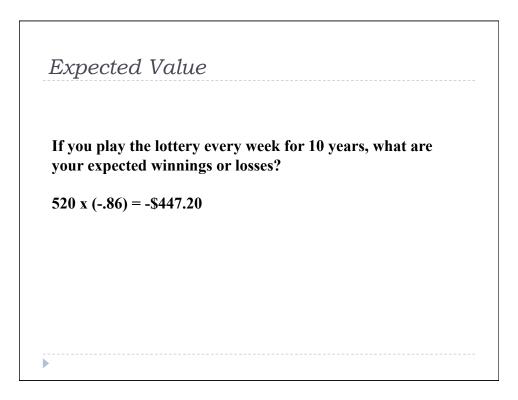


Lottery		
Calculate the probab	ility of winning in 1 try	y:
$\frac{1}{\binom{49}{6}} = \frac{1}{\frac{49!}{43!6!}} = \frac{1}{\frac{49!}{43!6!}}$ The probability functio	$\frac{1}{13,983,816} = 7.2 \times 10^{-8}$ on (note, sums to 1.0):	"49 choose 6" Out of 49 numbers, this is the number of distinct combinations of 6.
x\$	x\$ p(x)	
-1	.99999992	28
+ 2 million	7.2 x 10 ⁻⁸	

The probability function		
x\$	p(x)	
-1	.999999928	
+ 2 million	7.2 x 10-8	-
Expected Value		





<u>Gambling</u> (or how casinos can afford to give so many free drinks...)

A roulette wheel has the numbers I through 36, as well as 0 and 00. If you bet \$I that an odd number comes up, you win or lose \$I according to whether or not that event occurs. If random variable X denotes your net gain, determine the expected value of X.

<u>Gambling</u> (or how casinos can afford to give so many free drinks...)

A roulette wheel has the numbers I through 36, as well as 0 and 00. If you bet I that an odd number comes up, you win or lose I according to whether or not that event occurs. If random variable X denotes your net gain, determine the expected value of X.

E(X) = I(18/38) - I(20/38) = -\$.053

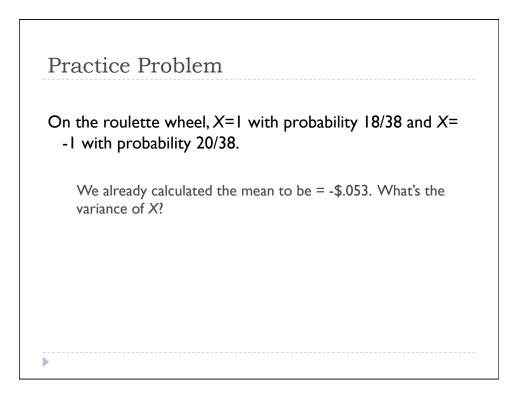
On average, the casino wins (and the player loses) 5 cents per game.

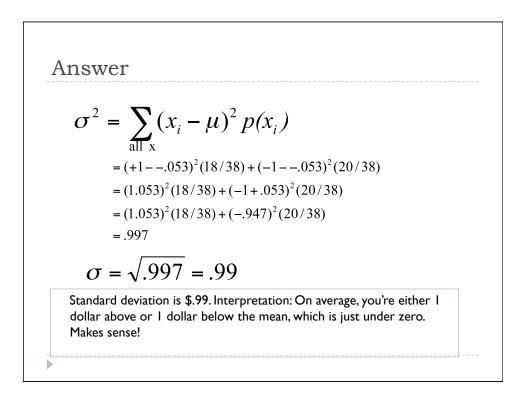
The casino rakes in even more if the stakes are higher:

E(X) = 10(18/38) - 10(20/38) = -\$.53

If the cost is \$10 per game, the casino wins an average of 53 cents per game. If 10,000 games are played in a night, that's a cool \$5300.

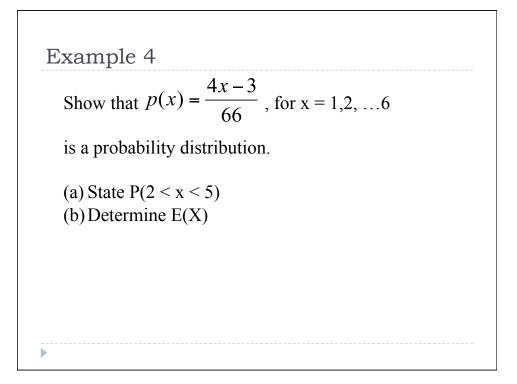


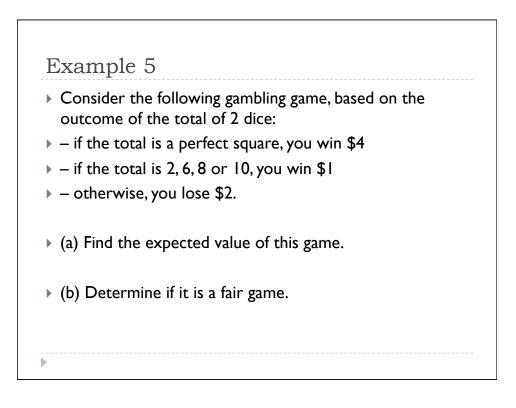




	ur HL Stats & Probability distrib	•	lnit test so	ores are	describe	d by the	following
	Score	40	50	60	70	80	
	P(Score)	.1	.2	.3	.3	.1	
M sti de	etermine the me r. S, in yet anoth- udents will not b cides the actual Grade = 1.5 * Sco	er act of be be denied a grades will	nevolence dmission t	e, decides	to scale		•
	etermine the me						

•	probability th	at a 6 app	bears	is tw	vice t	he pi	obat	oility	more often. The of a 5 and 3 times the re unchanged from a
Þ	The probabili	ty distrib	ution	table	e is g	iven	belo	W.	
		x	1	2	3	4	5	6]
		$\Pr(x)$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{x}{3}$	$\frac{x}{2}$	x	
►	Find:								
•	(a) The value probability di		-	obabi	lity c	listri	butio	n an	d hence complete the
•	(b) The proba with the 'norr		-	-					of these dice. Compare





Example 6Find the missing profit (or loss) so that the following

probability table has an expected value of 0.	
probability table has all expected value of 0.	

X	4	5	6	7	8	9	10
$\Pr(X = x)$	0.1	0.06	0.25	0.16	0.09	0.21	0.13
Gain	-3	4	-2	5	-8	12	

–	•	 I	1 •1•.	ı.	•1 .•		·····	
For the foll	owing	proba	ability	' distr	ibutic	on calc	ulate:	
E(X)								
E(2X)								
E(X + 2)								
E(X ²)								
$E(X^2) - [E(X^2) - [E(X^$	X)] ² .							
· / - ·	, -							
	-2	-1	0	1	2	3	4	5
x								

