Michael Plasmeier 12/8

Probability Practice

Draw an **AREA model or TREE DIAGRAM** & find the probability.

1) Tossing a die and spinning a red, white, & blue spinner with all three parts equal.

Find:

a) P(odd,red)=$\frac{3}{18}=\frac{1}{6}$ b) P(3, not red)=$\frac{2}{18}=\frac{1}{9}$ c) P(prime,white)=$\frac{3}{18}=\frac{1}{6}$

AREA model or TREE DIAGRAM

	R	W	B
1			
2			
3			
4			
5			
6			

18

Billy's Socks

Socks: 4 B, 3 R

	B_1	B_2	B_3	B_4	R_1	R_2	R_3
B_1	X	PB	PB	PB			
B_2	PB	X	PB	PB			
B_3	PB	PB	X	PB			
B_4	PB	PB	PB	X			
R_1					X	PR	PR
R_2					PR	X	PR
R_3					PR	PR	X

P(Pair black) $\frac{12}{42}=\frac{2}{7}$

P(Pair Red) $\frac{6}{42}=\frac{1}{6}$ $\frac{1}{7}$

B: B, B, B, R, R, R → $3\times4=12$, $6\times4=24$, +18

R: B, B, B, R, R, R → $2\times3=6$, $6\times3=18$

42

Michael Plasmeier 12/8

Draw an **AREA model or TREE DIAGRAM** & find the probability.

TRug

2) Flipping a coin and spinning a green, red, white, & blue spinner with all four parts equal.

Find:

a) P(H,red)=$\frac{1}{8}$ b) P(T, not red)=$\frac{3}{8}$ c) P(H,white or green)=$\frac{2}{8}$ $\frac{1}{4}$

AREA model or TREE DIAGRAM

	G	R	W	B
H	H,G	H,R	H,W	H,B
T	T,G	T,R	T,W	T,W

H
T
Green
Red
White
Blue
Green
Red
white
Blue

1,234

Billy Basketball

30% 0
37.8%
28% 70% 42%
3
11 4.2% 42 42×10=4.2
7×4=28% 7×6=42

1. Coach expects 3pts
prob × pts × turns
2. E.V. $\frac{38}{100} \times \frac{0}{1} \times \frac{100}{1} = 0$

$\frac{28}{100} \times \frac{1}{1} \times \frac{100}{1} = 28$

$\frac{4.2}{100} \times \frac{2}{1} \times \frac{100}{1} = 8.4$

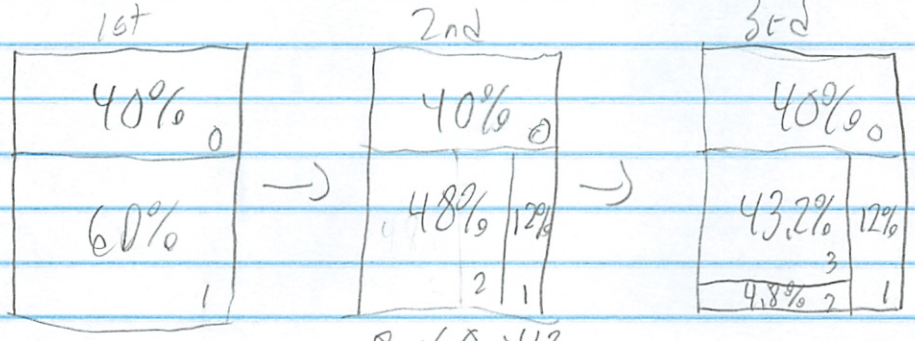
$\frac{37.8}{100} \times \frac{3}{1} \times \frac{100}{1} = 113.4$

149.8
÷ 100
1.498
pts per turn

Martian B-Ball
3-Throws

12/9

60% 1st
80% 2nd
90% 3rd



.8 × 60 = 48
new % blocks there

Get ans from this chart

1. Expected Value = 3

2. prob × pts × trys

$\frac{40}{100} \times \frac{0}{1} \times \frac{100}{1} = 0$

$\frac{12}{100} \times \frac{1}{1} \times \frac{100}{1} = 12$

$\frac{4.8}{100} \times \frac{2}{1} \times \frac{100}{1} = 9.6$

$\frac{43.2}{100} \times \frac{3}{1} \times \frac{100}{1} = 129.6$

151.2 / 100 = 1.512 expected value per turn

PSSA Review

1. $x+4=6$
$-4\ \ -4$
$x=2$
Check: $x+4=6$
$2+4=6$
$6+6=6$ ✓

2. $2x-4=8$
$+4\ \ +4$
$2x=12$
$\div 2\ \ \div 2$
$x=6$
Check $2x-4=8$
$2(6)-4=8$
$12-4=8$
$8=8$ ✓

Pool line

Undo ( ) 3
- Combine like terms
- Get x to 1 side
- Undo + -
- Undo x ÷

$4(x-2)-2x+3=3x-1$
$+2\ \ +2$
$4x-2x+3=3x+1$
$-1\ \ -1$
$4x-2x+2=3x$
$-2x+2=3x$
$+2x\ \ +2x$
$2=5x$
$\frac{2}{5}=\frac{5x}{5}$
$2.5=x$

Distribute

$4(x-2)-2x+3=3x-1$
$4x-8-2x+3=3x-1$
$2x-8+3=3x-1$
$2x-5=3x-1$
$+1\ \ +1$
$2x-4=3x$
$-2x\ \ -2x$
$-4=1x$

✓: $4(-4-2)-2(-4)+3=3(-4)-1$
$4(-6)-\ -8+3=-12-1$ ✓
$-24+8+3=-13$ ✓ $-13=-13$

Distributive Properties

4) $2(3x-4)$
$-2\cdot 3x+-2\cdot -4$
$-6x+8$

5. $2(x-4)-3(2-x)=7-(x+1)$
$2x-8-6--3x=7-x-1$
$5x-14=-7x+6-x$
$+14\ \ +14\ \ +7x\ \ +x$
$5x=-7x+20$
$+7x\ \ +7x$
$12x=20$
$\frac{12x}{12}=\frac{20}{12}$
$x=1.75$

Copy Written

✓: $2(1.75-4)-3(2-1.75)=7-(1.75+1)$
$2(-2.25)-3(.25)=7-2.75$
$-4.5-.75=-5.25$
$-5.25=-5.25$ ✓

New $2(3\frac{1}{3}-4)-3(2-3\frac{1}{3})=7-(3\frac{1}{3}+1)$
$2(-\frac{2}{3})-3(-1\frac{1}{3})=7-4\frac{1}{3}$
$-1\frac{1}{3}+4=3\frac{2}{3}$
$-2\frac{1}{3}=3\frac{2}{3}$ ✗

HW

1. $4(3x-8)=8(x-3)-1$
$12x-32=8x-24-1$
$+32\ \ +32$
$12x=8x+7$
$-8x\ \ -8x$
$4x=7$
$\frac{4x}{4}=\frac{7}{4}$
$x=1.75$

✓ $4([3\cdot 1.75]-8)=8(1.75-3)-1$
$4(5.25-8)=8(-1.25)-1$
$4(-2.75)=-10-1$
$-11=-11$ ✓

2. $6n=2n-56$
$-2n\ \ -2n$
$4n=-56$
$\frac{4n}{4}=\frac{-56}{4}$
$n=-14$

✓ $6(-14)=2(-14)-56$
$-84=-84$ ✓

$6n=2n-56$

12/14

3. $2x-5=-x-(5-4x)$
$2x-5=-x-5-4x$
$2x-5=3x-5$
$+5\ \ +5$
$2x=3x$
So x must = 0

✓: $2(0)-5=-0-(5-(4\cdot 0))$
$0-5=-(5-0)$
$-5=-5$ ✓

$2(3\frac{1}{3}-4)-3(2-3\frac{1}{3})=7-(3\frac{1}{3}+1)$
$2(-\frac{2}{3})-3(-1\frac{1}{3})=7-4\frac{1}{3}$
$-1\frac{1}{3}+4=2\frac{2}{3}$
$2\frac{1}{3}=2\frac{1}{3}$ ✓

$2x-5=-x-(5-4x)$

Carrier Fair Deal (20)

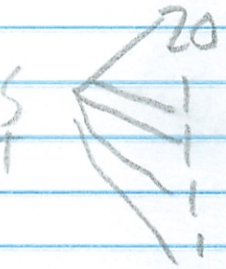
Carrier 3 (21)

12/14

$\frac{1}{6} \times \frac{20}{1} \times \frac{5}{1} = 20$

$\frac{4}{5} \times \frac{1}{1} \times \frac{5}{1} = 4$

24/5 = 4.8 per turn.



It's worse because he only makes 4.8 a week not $5 should do when takes certain amt

Carrier 3 (21)

12/15

2 × $5
3 × $1
2 bills

$\frac{2}{20} \frac{10}{1} \times \frac{20}{1} = 28$

$\frac{12}{20} \times \frac{6}{1} \times \frac{20}{1} = 72$

5 | 5 = 10
1 | 6
1 | 6
1 | 6

$\frac{6}{20} \frac{2}{1} \frac{20}{1} = 12$

104/20 = 5.20 average per week

5 | 5 10
1 | 6 6
1 | 6
1 | 6

1 | 5 5 6
1 | 5 6
1 | 2

1 | 5 6
1 | 5 6
1 | 2 2

1 | 5 6
1 | 5 6
1 | 2 2

1 | 5 6
1 | 5 6
1 | 2 2

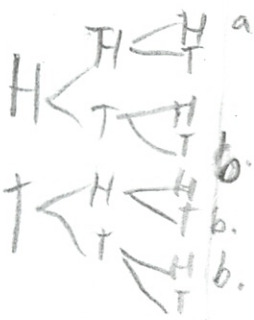
This situation would be better for the carrier.

	5	5	1	1	1
5	X	10	6	6	6
5	10	X	6	6	6
1	6	6	X	2	2
1	6	6	2	X	2
1	6	6	2	2	X

Michael Plasmeier 12/15

Quirk at the Fair

Mr. Quirk decides to open a booth at the local fair. His game involves flipping a coin 3 times. If you get three heads you win $5. If you get exactly one head you win $2. On the other hand, if you get exactly two heads you must pay Mr. Quirk $6. Will Mr. Quirk gain or lose money? Draw an area model and show all work to support your answer.



$\frac{1}{8} \times \frac{5}{1} \times \frac{8}{1} = 5$

$\frac{3}{8} \times \frac{2}{1} \times \frac{2}{1} = 6$

$\frac{3}{8} \times \frac{6}{1} \times \frac{8}{1} = 18$ not 6

$18 \div 8 = 1.875$ → $1.88

HHH a.
HHT c.
HTH c.
HTT b
THH c.
THT b
TTH b
TTT

Mr. Quirk will loose money.
He will loose 62½¢ per turn.

He wins 87½¢ on average a turn

PIG WORKSHEET
EXPECTED VALUE PRACTICE
RUGS & TREES

NAME : Michael Plasmeier DATE : 12/17

DO ALL WORK ON SEPARATE PAPER.

FOR EACH OF THE FOLLOWING :

Make a RUG or TREE and find the E.V. for each.

Like the Letter Carrier Problem, two bills are taken, NO the first is NOT replaced!
Each numbered problem is a new and different situation.

1) 2 - $ 5 bills and 3 - $ 1 bills

$5.20

2) 1 - $ 10 bill, 3 - $ 5 bills, and 6 - $ 1 bills

$6.20

3) 3 - $ 5 bills and 2 - $ 1 bills

~~$5.44~~

$6.80

Cartier

1.

	5	5	1	1	1
5	X	10	6	6	6
5	10	X	6	6	6
1	6	6	X	2	2
1	6	6	2	X	2
1	6	6	2	2	X

$\frac{2}{30} \times \frac{90}{1} \times \frac{30}{1} = 20$

$\frac{12}{20} \times \frac{6}{1} \times \frac{20}{1} = 72$

$\frac{6}{20} \times \frac{3}{1} \times \frac{20}{1}$ 12

EUPT

109/20 = 5.20

2.

	10	5	5	5	1	1	1	1	1	1
10	X	15	15	15	11	11	11	11	11	11
5	15	X	10	10	6	6	6	6	6	6
5	15	10	X	10	6	6	6	6	6	6
5	15	10	10	X	6	6	6	6	6	6
1	11	6	6	6	X	2	2	2	2	2
1	11	6	6	6	2	X	2	2	2	2
1	11	6	6	6	2	2	X	2	2	2
1	11	6	6	6	2	2	2	X	2	2
1	11	6	6	6	2	2	2	2	X	2
1	11	6	6	6	2	2	2	2	2	X

$\frac{6}{90} \times \frac{15}{1} \times \frac{90}{1} = 90$

$\frac{12}{90} \times \frac{11}{1} \times \frac{90}{1} = 132$

$\frac{6}{90} \times \frac{10}{1} \times \frac{90}{1} = 60$

$\frac{36}{90} \times \frac{6}{1} \times \frac{90}{1} = 216$

$\frac{30}{30} \times \frac{2}{1} \times \frac{90}{1} = 60$

558/90 = 6.2 EU.

10%	11
30%	5
60%	1

Can Deal as Group

$3\frac{1}{2}$	$6\frac{2}{3}$	
$3\frac{1}{2}$	20 (10)	$6\frac{2}{3}$ (14)
$3\frac{1}{2}$ (2)	$6\frac{2}{3}$ (11)	20 (6)

60% 5
40% 1

→

30% 10	30% 6
10% 2	30% 6

I can deal as group

3.

	5	5	5	2	2
5	X	10	10	6	6
5	10	X	10	6	6
5	10	10	X	6	6
2	6	6	6	X	4
2	6	6	6	4	X

$\frac{16}{20} \times \frac{10}{1} \times \frac{25}{1} = 60$

$\frac{12}{20} \times \frac{6}{1} \times \frac{25}{1} = 72$

$\frac{2}{20} \times \frac{2}{1} \times \frac{25}{1} = 4$

136/200 = 5.49 E.V.

$6.20

Steve B-Ball

1. 90%
2. 70%
3. 50%
4. 80%

10% 0
90% 1

1st

10% 0
27% 1
63% 2

2nd

10% 0
27% 1
31.5% 2
31.5% 3

3rd

$\frac{10}{100} \times \frac{0}{1} \times \frac{100}{1} = 0$

$\frac{27}{100} \times \frac{1}{1} \times \frac{100}{1} = 27$

$\frac{31.5}{100} \times \frac{2}{1} \times \frac{100}{1} = 63$

$\frac{6.3}{100} \times \frac{3}{1} \times \frac{100}{1} = 18.9$

$\frac{25.2}{100} \times \frac{4}{1} \times \frac{100}{1} = 100.8$

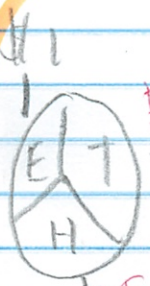
10% 0
27% 1
31.5% 2
25.2 4 | 6.3 3

4th

209.7/100 = 2.097 E.P.T.

HW 12/20

Problem about $\frac{h}{2^n}$ — n = num terms; # of possibilities; stop after 1



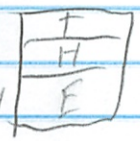
1 T
2 x
3 x
4 x
Generalization

$\frac{(x+2)\times 10 + x+2}{100}$

$\frac{h}{3^n}$

T goes up each time

in decimal

1. 

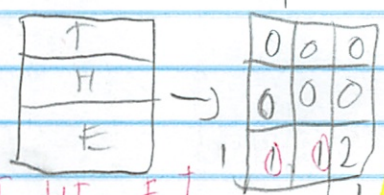
.33

$\frac{66}{100} \times 0 \times \frac{100}{1} = 0$

$\frac{33}{100} \times \frac{1}{1} \times \frac{100}{33} = \frac{33}{33}$

33/100 = .33 EV

But I did it that way like I go

2. 

List: TT HT ET
TH HH EH
TE HE EE

$\frac{66}{100} \times 0 \times \frac{100}{1} = 0$

~~$\frac{22}{100} \times 1 \times \frac{100}{1} = 22$~~

$\frac{22}{99} \times 2 \times \frac{100}{1} = 22$

.22

22/100 = .44 EV

Do Actual not %

3. 

.137

$\frac{44.4}{100} \times 0 \times \frac{100}{1} = 0$

$\frac{26}{27} \times 0 \times \frac{100}{1} = 0$

$\frac{37}{100} \times 1 \times \frac{100}{1} = 37$

$\frac{1}{27} \times 2 = \frac{2}{27}$

$\frac{14.8}{100} \times 2 \times \frac{100}{1} = 29.6$

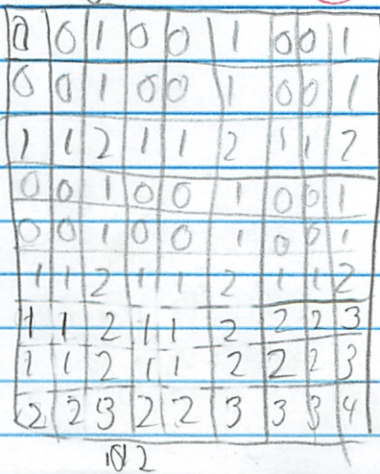
.11

$\frac{37}{100} \times 3 \times \frac{100}{1} = 11.1$

77.7/100 = .55 EV

$\frac{1}{3^n}$ $\frac{4}{81}$

27 x3

4. 

102

$\frac{28.8}{100} \times 0 \times \frac{100}{1} = 0$

$\frac{31.2}{100} \times 1 \times \frac{100}{1} = 31.2$

$\frac{21.6}{100} \times 2 \times \frac{100}{1} = 43.2$

$\frac{7.2}{100} \times 3 \times \frac{100}{1} = 21.6$

$\frac{1.2}{100} \times 4 \times \frac{100}{1} = 4.8$

100.8/100 = 1.008 EV

Most likely wrong

Equations

12/22

Michael Plasencia

1. $3x-5=2(x+7)$

$3x-5=2x+14$

$-2x \quad -2x$

$1x-5=14$

$+5 \quad +5$

$x=19$

$3x-5=2(x+7)$

$3(19)-5=2(19+7)$

$57-5=2(26)$

$52 \neq 52$ ✓

2. $\frac{1}{2}(2x-5)=\frac{2}{3}(x-6)$

$x-2\frac{1}{2}=\frac{2}{3}x-4$

$+4 \quad +4$

$x+1.5=\frac{2}{3}x$

$-3x \quad -3x$

$-2x+1.5=-2x$

$-3x \quad -3x$

$1.5=-x$

$-1.5=+x$ ✗

Wrong ☹

$\frac{1}{2}(2x-5)=\frac{2}{3}(x-6)$ — Wrong?

? copy problem wrong

$\frac{1}{2}(2\cdot-1\frac{1}{2}\cdot-5)=\frac{2}{3}(1\frac{1}{2}\cdot-6)$

$\times 6 \quad \times 6$

$3(2x-5)=4(x-6)$

$6x-15=4x-6$ Wrong

$+15 \quad +15$

$6x=4x+9$

$-4x \quad -4x$

$2x=9$

$x=4.5$

$x+1.5=\frac{2}{3}x$

$1\frac{1}{3}x+1.5=x$

$4x+1.5=3x$

$x+1.5=0$ ✗

$-x \quad -x$

$1.5=-x$? Can do ?

$x=-1.5$

$x-2.5=\frac{2}{3}x-4$

$-3x \quad -3x$

$3x-2.5=2x-4$

$-2x \quad -2x$

$x-2.5=-4$

$+2.5 \quad +2.5$

$x=-1.5$

$\frac{1}{2}(2x-5)=\frac{2}{3}(x-6)$

$\frac{1}{2}(2\cdot-4.5-5)=\downarrow$

$\frac{1}{2}(9-5)=\downarrow$

$\frac{1}{2}(4)=\frac{2}{3}(-4.5-6)$

$2=\frac{2}{3}(-1.5)$

$2=-1$ ✗

Bill at Fair

E
O

$\frac{1}{2}$

EE	EO
OE	OO

$\frac{1}{4}$

EEE	EOE
EEO	EOO
OEE	OOE
OEO	OOO

$\frac{1}{8}$

EEEH	EEET	EOEH	EOET
EEOH	EEOT	EOOH	EOOT
OEEH	OEET	OOEH	OOET
OEOH	OEOT	OOOH	OOOT

$\frac{1}{16}$

EEEHH	EEETH	EOEHH	EOETH
EEEHT	EEETT	EOEHT	EOETT
EEOHH	EEOTH	EOOHH	EOOTH
EEOHT	EEOTT	EOOHT	EOOTT
OEEHH	OEETH	OOEHH	OOETH
OEEHT	OEETT	OOEHT	OOETT
OEOTH	OEOTH	OOHH	OOOTH
OEOTT	OEOTT	OOHT	OOOTT

$\frac{1}{32}$

$\frac{4}{32} \times 8 \times \frac{32}{1} = 32$

$\frac{6}{32} \times 1.25 \times \frac{32}{1} = 7.5$

$\frac{9}{32} \times 4 \times \frac{32}{1} = 36$

$\frac{6}{32} \times 2.50 \times \frac{32}{1} = 15$

$11.5/32 = .359$ EU per turn

Bill will gain almost 40¢ a turn

$\frac{14}{3}x + 3 = 11 - 5x$

$+5x \quad +5x$

$9\frac{2}{3}x + 3 = 26$

$-3 \quad -3$

$9\frac{2}{3}x = 23$

$\times \frac{3}{29} \quad \times \frac{3}{29}$

$x = \frac{69}{29}$

$x = 2\frac{11}{29}$

$\frac{1}{2}(14x + 9) = 11 - 5(x - 3)$

$\times 3$ ← must also get 3

$1(14x + 9) = 33 - 15(x - 3)$

$14x + 9 = 33 - 15x + 45$

$14x + 9 = -15x + 78$

$-14x \quad -14x$

$9 = x + 78$

$-78 \quad -78$

$-69 = x$

$4\frac{1}{3}x + 3 = 11 - 5x - 15$

$+5x \quad +15$

$9\frac{1}{3}x + 3 = -4 + 26$

2 negs = +

$-3 \quad -3$

$9\frac{1}{3}x = -7$

Should I go on #25

1/4/05

Michael Plasmeier

	Stop	Go	EV
1.	10 pts	$\frac{1}{3}$ 0	$6 \times 0 = 0$
		$\frac{1}{3}$ 11	$11 \times 0 = 110$
		$\frac{1}{3}$ 14	$10 \times 14 = 140$
			$250 / 30 = 8.33$ worse then stoping

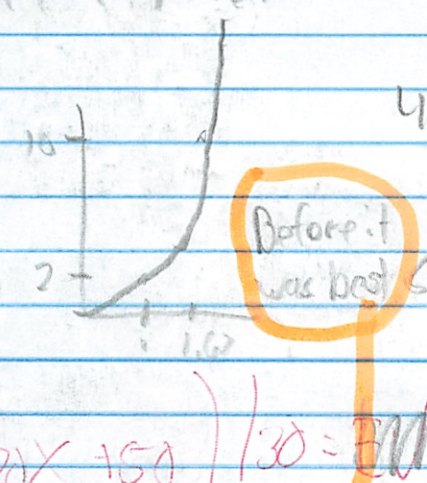
		# of turns	
2.	7 pts	$\frac{1}{3}$ 0	$10 \times 0 = 0$
		$\frac{1}{3}$ 3	$3 \times 10 = 30$
		$\frac{1}{3}$ 6	$10 \times 6 = 60$
			$90 / 30 = 3$ better then stoping

b: Yes, better average

	2	10
Go	3	8.33
Diff	1	1.67

3	$\frac{1}{3}$ 0	10×0	0
	$\frac{1}{3}$ 4	10×4	46
	$\frac{1}{3}$ 7	10×7	76
			$110 / 30 = 3.66$ better

4	6	10×0	50
	5	10×5	80
	8	6×8	120
			$250 / 30 = 4.33$ better



	6	10×6	
	6	10×6	60
	9	10×9	90
Should I go			$150 / 30 = 5$ same

$(20 \times 150) / 30 = 100$

	2	3	4	5	6	
Stop						$100 / 30 = 5.66$
Go	3	3.66	4.33	5	5.66	$8.33 + \frac{2}{3} = 9$
Diff	+1	+.66	+.33	0	-.33	+1.67 — 3

Is it good to go on

$\frac{1}{3}$

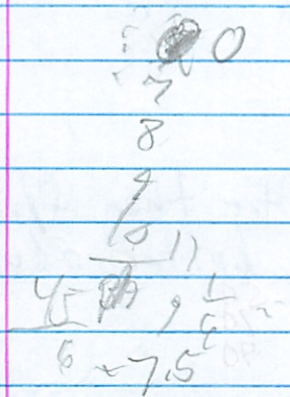
2x + possible

Go on + find equivalent

Shortcut

1. Did Class thing

Average pts possible * chance of getting pts



Back to Big Pig

1/4

2 pts

0	2	3	4	5	6

3.33

20/6 = 3.33 EV

6	6
6^2	36
6^3	216
6^4	1296
6^5	7776
6^6	46656

3 pts

3.83

6					
0	0				
	4				
0	5	3	4	5	6
	6				
	7				
	8				

0 - 7 = 0

3 - 6 = 18

4 - 7 = 28

5 - 7 = 35

6 - 7 = 42

7 - 7 = 7

8 - 8

138/36 = 3.83 EV

4 pts

36					
0	0	0			
	4	5			
	5	6			
0	6	7	4	5	6
	7	8			
	8	9			
		36			

4.36

0 - 48 = 0

4 - 42 = 168

5 - 48 = 240

6 - 42 = 288

7 - 12 = 84

8 - 12 = 96

9 - 6 = 54

930/216 = 4.30 EV

20
138
930

1386 = 192/3

192/132

Go on p2

Real Pig

	2	3	4
	3,33	3,83	4,30
	+1,33	+3,83	+1,30
		15	,47

2	3,33 } ,15
3	3,83 } ,47
4	4,30

Best to stop | choice

30	5
40	15
50	15
60	20
70	35

Pass	Dat
3	2/3 ,66
4	,71
6	,83

Go in a class

chop off

0

3

Stop	2	3	4	5	6	7	8	
Go	5	5,83	6,66	7,5	8,33	9,16	10	
diff	+3	2,83	2,66	2,5	2,33	2,16	2	

+,83 +,83 +,84 +,83

2	4,17
1	~~3,34~~ 4,16
0	~~2,5~~ 3,33

Yes

$3\frac{1}{3} \times +,83$

$,83 \times 3\frac{1}{3}$

(50 x +20) / 60 = FU.

4	10,83
10	11,66
11	12,49
12	13,32
13	14,15
14	14,98 close
15	15,81 15,81
16	16,66
17	17,49
18	18,32
19	19,16
20	20 21/20,83

0	0
	20
	30
	40
	50
	60

200/60 = 3,33

0	
	30
	40
	50
	60
	70

360/60 = 4,16

15	0
	120
	180
	200
	210
	240

Solution: Chop off 0 (see) to get 1,083

2	300
1	250
0	200

is best strategy

6 pts

1/6	0
1/6	8
9	80
10	90
11	100
12	110
	120

500/60 = 8,33

7 pts

1/7	0
7	70
8	80
9	90
10	100
11	110
+50	120

450/60 = 7,5

4 pts

0	
	60
	70
	80
	90
	100

400/60 = 6,66

3

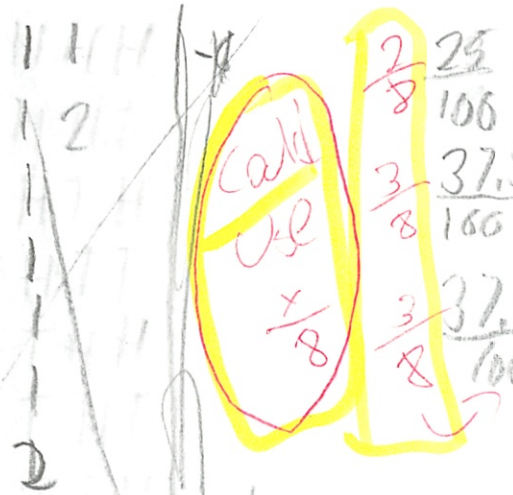
0	
	50
	60
	70
	80
	90

360/60 = 5,83

Michael Plasmeier

Trabosh at the Fair

Mr. Trabosh decides to open a booth at the local fair. His game involves rolling a die 3 times. If you roll three even numbers or three odd numbers you win $6. If you roll exactly one even number you win $1. On the other hand, if you roll exactly two even numbers you must pay Mr. Trabosh $4. Will Mr. Trabosh gain or lose money? Draw an area model and show all work to support your answer.



$\frac{25}{100} \times -6 \times \frac{100}{1} = -150$

$\frac{37.5}{100} \times -1 \times \frac{100}{1} = -37.5$

$\frac{37.5}{100} \times 4 \times \frac{100}{1} = 150$

-27.5

$\overline{150}$

$-.375$ Per turn EV

$\frac{n}{6^n}$ $\frac{3}{6^3}$

$\frac{3}{216}$

.013

Use example trees

$E(2) - \frac{5}{8}$

$O(1)$

Mr. Trabosh loses $\$$ to tune of $37\frac{1}{2}$¢ a turn

.15

E
O

.25

EE	EO
OE	OO

.125

EEE	EOE
EEO	EOO
OEE	OOE
OEO	OOO

can't use $\frac{n}{x^n}$

x = # possibilty

n = # turns

will be x pts = n

1. $\frac{2}{5}x + 7 = 13$

$-7 \quad -7$

$\frac{2}{5}x = 6$

$\times 5 \quad \times 5$

$2x = 30$

$\frac{2x}{2} = \frac{30}{2}$

$x = 15$

$\frac{2}{5}x = 6$

$\times\frac{5}{2} \quad \times\frac{5}{2}$

$1x = 15$

$\frac{2}{5}x + 7 \stackrel{?}{=} 13$ ← copy original problem

$\frac{2}{5}(15) + 7 = 13$

$6 + 7 = 13$

$13 = 13$ ✓

2. $3x + 15 = -4x + 51$

$+4x \quad +4x$

$12x + 15 = 51$

$-15 \quad -15$

$\frac{12x}{12} = \frac{36}{12}$

$x = 3$

$3x + 15 \stackrel{?}{=} -4x + 51$

$3(3) + 15 = -4(3) + 51$

$24 + 15 = -12 + 51$

$39 = 39$ ✓

3. $15(1 - x) = -3(-x - 2)$

$15 - 15x = 3x + 6$

$-6 \quad -6$

$9 - 15x = 3x$

$+15x \quad +15x$

$\frac{9}{18} = \frac{18x}{18}$

$.5 = x$

$15(1 - x) \stackrel{?}{=} -3(-x - 2)$

$15(1 - .5) = -3(-.5 - 2)$

$15(.5) = -3(-2.5)$

$7.5 = 7.5$ ✓

$15\left(1 - \frac{1}{2}\right) \stackrel{?}{=} -3\left(-\frac{1}{2} - 2\right)$

$15\left(\frac{1}{2}\right) = -3\left(-2\frac{1}{2}\right)$

$7\frac{1}{2} = -3\left(2\frac{1}{2}\right)$

$(3)\left(2\frac{1}{2}\right)$

$6 \quad 1\frac{1}{2}$

$7\frac{1}{2}$

Michael Plasmeier

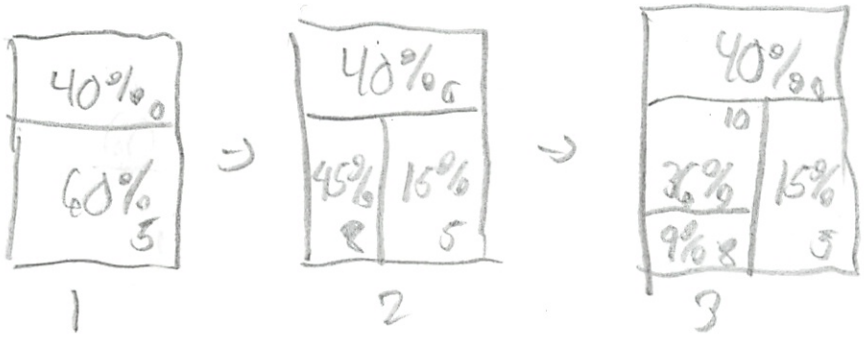
In Martian Lawn Darts, you earn points in a special way. Your first toss is taken from 30 feet away, and if you make it, you earn 5 points. If you do make it, you get to try a toss from 20 feet away. If you make that toss, you earn 3 more points, and a chance to try again. If you do get a third toss, it is taken from 15 feet away, and it is worth 2 more points. So, if you make all 3 tosses, you actually earn a total of 10 points for your turn. Your turn is over as soon as you miss the target on your toss.

Captain Quirk makes 60% of his tosses from 30 feet, 75% from 20 feet, and 80% from 15 feet away.

a) What is Captain Quirk's expected value for ~~extra~~ points in Martian Lawn Darts?

b) If Captain Quirk gets 20 turns in a game of Martian Lawn Darts, how many points would you expect the Captain to make?

a.



$\frac{40}{100} \times 0 \times \frac{100}{1} = 0$

$\frac{15}{100} \times 5 \times \frac{100}{1} = 75$

$\frac{9}{100} \times 8 \times \frac{100}{1} = 72$

$\frac{36}{100} \times 10 \times \frac{100}{1} = 360$

$507 / 100 = 5.07$ EV Points per turn.

b. 101.4 Estimated Pts per 20 terns

REVIEW SHEET for PIG

NAME : Michael Plasmeier DATE : 1/05

DO ALL WORK ON SEPARATE PAPER !!!!

1. Sheila has 6 different blouses and 5 different pairs of slacks. How many different outfits can she wear ? 30 2 types, can do 2 things — x — = 30

2. A bag contains 80 chips. Forty chips are red, 20 are white, and the rest are blue. What is the probability that a chip drawn at random from the bag is NOT white ? 3/4. P(not) 9/9

3. A box contains an equal amount of red and white balls. Altogether there are 50 balls. A red ball is picked at random and NOT replaced. A second ball is drawn and NOT replaced, it to is red. What is the probability that a third ball chosen at random will be red ? 23/98 x/y

4. The average (arithmetic mean) of eight test scores is 86 . Four of the scores are 80 , 90 , 80 , and 90. Write a short explanation of how you would approach finding what the other four test scores could possibly have been ? Based on the given scores, what "kind" of scores do you <u>think</u> were achieved ? What could be a logical range of scores ? Please give an example of four scores that work . needs total give and take % - situations

5. Billy has two bags of chips. One bag has chips numbered 1 , 2 , 3 , 4 and the other bag has chips numbered 1 , 2 , 3 . Make area rugs or charts to help find the following.
   a) What is the probability of a sum of 5 ? 1/4
   b) What is the probability of a product of 4 ? 1/6
   c) What probability is better, a sum of 6 or a sum of 4 ? EXPLAIN !
   d) What probability is better, a product of 6 or a product of 2 ? EXPLAIN !

2 thing + add +

6. Joe flips a coin 2 times. If he gets the sequence {H , T} he gets 2 points and if he gets the sequence {H , H} he gets 3 points. Anything else results in a 0 point turn. What is his Expected Value per turn for this game ? EXPLAIN !!! EV games Coin flips pts x prob x turns

7. Billy has 80 % accuracy from the free-throw line on his first shot, but only 50 % accuracy on his second shot. Draw an area diagram (rug) and show all of work necessary to support your answer in finding his expected points per one-and-one situation. 2 rugs % rugs 1.2 pt per turn 80 x .5 = 40

8. You are at the St. Denis fair. Mr. Bill has a bag that contains three $5 bills , two $2 bills , and one $1 bill. Each player will draw two bills out of the bag. If the contestant draws two $5 bills or two $2 bills , the contestant keeps the money. Any other combination the contestant gets nothing. It costs $4 to play per turn.
   a) Will Mr. Bill make money for good old St. Denis in the long run ?
   b) How much money would a contestant gain or lose on average ? EXPLAIN !!!
   c) Explain what would happen, (theoretically), if 100 people played ?

On test

80 ¢ 423

pt rug

chart w/ crossouts

2 things x root diagnal

division problem

EV loss per turn

Pig Review

1/5

1. S1 S2 ...
B1
B2
:
:
$6 \times 5 = 36$

2. $\frac{1}{2}$ Red $\frac{1}{4}$ White $\frac{1}{4}$ Blue P(not white) $= \frac{3}{4}$

3. 25 Red 25 White
24
23
$\frac{23}{48} = P(\text{Red})$

4. Probably lower (or higher) scores and not ending in 10's
You can add up average now (85)
Then get 80, 90, 80, 95 and change last one (guess + check) to see if it works

1st try = to low 85.625
2nd try (100) = 86.25 - to high } round to get it right
3rd (97) 85.875
98 = 86

If you take one from one, you can give it away.

85 90 80 90 100 100 100 ? = 640 → 688 total pts

2nd

86 x 8 = 688
needs tests = 340
÷ 4 = 87 - can have 4 of these or give + take

688
-640
48 min

1/5

5.

+	1	2	3	4
1	2	3	4	5
2	3	4	5	6
3	4	5	6	7

$P(5) = \frac{3}{12} = \frac{1}{4}$

×	1	2	3	4
1	1	2	3	4
2	2	4	6	8
3	3	6	9	12

$P(\times 4) = \frac{3}{12} = \frac{1}{6}$

c. $P(6) = \frac{2}{12}$ or $P(4) = \frac{3}{12}$ $\frac{1}{4}$ is more than $\frac{1}{6}$

d. $P(\times 6) = \frac{3}{12}$ or $\frac{2}{12}$ = Same Both same

6.

	H	T
H	HH	HT
T	TH	TT

$0 \times \frac{1}{2} \times \frac{3}{1} = 0$

$2 \times \frac{1}{4} \times \frac{4}{1} = 2$

$3 \times \frac{1}{4} \times \frac{4}{1} = 3$

Lablo

5/4 = 1.25 EV Pts per turn

7. 20% 0 / 80% 1 → 20% 0 / 40% 40 / 40% 2

$8 \times 50 = 40$

$0 \times \frac{20}{100} \times \frac{100}{1} = 0$

$1 \times \frac{40}{100} \times \frac{100}{1} = 40$

$2 \times \frac{40}{100} \times \frac{100}{1} = 80$

120/100 = 1.2 EV Pts per turn

8.

	5	5	5	2	2	1
5	X	10	10	0	0	0
5	10	X	10	0	0	0
5	10	10	X	0	0	0
2	0	0	0	X	4	0
2	0	0	0	4	X	0
1	0	0	0	0	0	X

Divided wrong

$\frac{6}{30} \times 10 \times \frac{36}{1} = 60$

$\frac{2}{30} \times 4 \times \frac{30}{1} = 8$

$\frac{22}{30} \times 0 \times \frac{30}{1} = 0$

68/30 = 2.27 EV per turn

2.27 Possible Gain

-4 to play

-1.73 loss for you

a make $8 | b = you loose 30 (advantage) 8.00 gain to b

Game of Pig Test

Name Michael Plasmeier 8848

Date 1/11/05

+1

Multiple choice: Circle the best answer for each of the following.

69/70

1) Bob has five different shirts and four different pairs of pants. How many different shirt-pant combinations can he wear? {5 pts}

A) 9 B) 25 C) 16 D) 20

2) A box contains 50 marbles. Twenty-five are red, 15 are white, and 10 are blue. Steve took a marble without looking. What is the probability that the marble is not blue? {5 pts}

A) 1/5 B) 1/3 C) 1/2 D) 3/4 E) 4/5

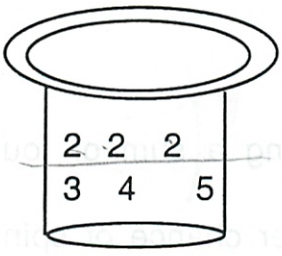
3) A bag contains an equal number of red and black checkers. Altogether, there are 24 checkers in the bag. A red checker is drawn from the bag and not replaced. A second red checker is drawn from the bag and not replaced. What is the probability that a third checker drawn from the bag will be red? {5 pts}

A) 5/12 B) 5/11 C) 11/24 D) 1/2 E) 5/6

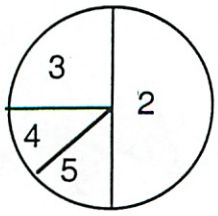
4) The average (arithmetic mean) of seven test scores is 86. Four of the scores are 80, 83,86 and 92. Which of the following could NOT be the other scores? {5 pts}

A) 80, 90, 91 B) 75, 88, 98 C) 85, 84,93 D) 78, 91, 92 E) 70, 95, 96

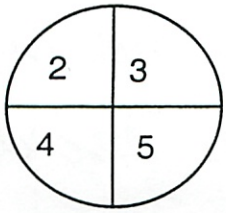
5) On which spinner is the chance of the arrow landing on 2 the same as the chance of picking 2 from the hat? {5 pts}



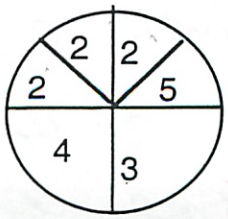
A)



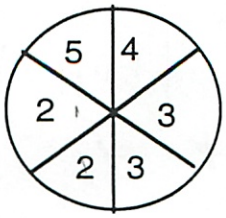
B)



C)

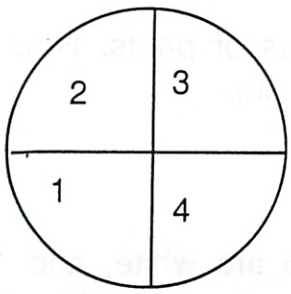


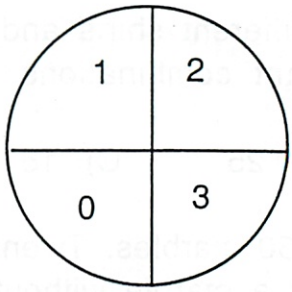
D)



Complete each of the following problems. Follow all directions.

6) Laura is going to spin each of these spinners and find the sum of the two numbers. {15 pts}





In the space below make a list or chart of all the possible outcomes.

1st / 2nd	1	2	3	4
0	1	2	3	4
1	2	3	4	5
2	3	4	5	6
3	4	5	6	7

1×1
2×2
3×3
4×4
5×3
6×2
7×1

16

a) What is the probability of spinning a sum of four? $P(\quad) = \frac{1}{4}$

b) Explain whether Laura has a better chance of spinning the sum of four or the sum of two?

(4) The sum of 4 has a $\frac{1}{4}$ chance while 2 has a $\frac{1}{8}$ chance. $\frac{1}{4}$ is better than $\frac{1}{8}$, so 4 is more likely than 2 to come up.

7) Consider the following game.
In each turn of the game, you flip a coin three times. If you get three heads, you win 7 points. If you get the sequence "head, tail, head" you get 3 points. If you get another sequence you get no points for that turn. What is your expected value per turn for this game? Explain your reasoning. {15 pts}

$\frac{6}{8} \times 0 \times \frac{8}{1} = 0$

$\frac{1}{8} \times \frac{7}{1} \times \frac{8}{1} = 7$

$\frac{1}{8} \times \frac{3}{1} \times \frac{8}{1} = 3$

$10/8 = 1.25$ EV Per turn

I know that both situations have a $\frac{1}{8}$ chance of occuring. I take the combined points and divide by 8 to find E.V. Per Turn.

HHH HHT HTH HTT
THH THT TTH TTT

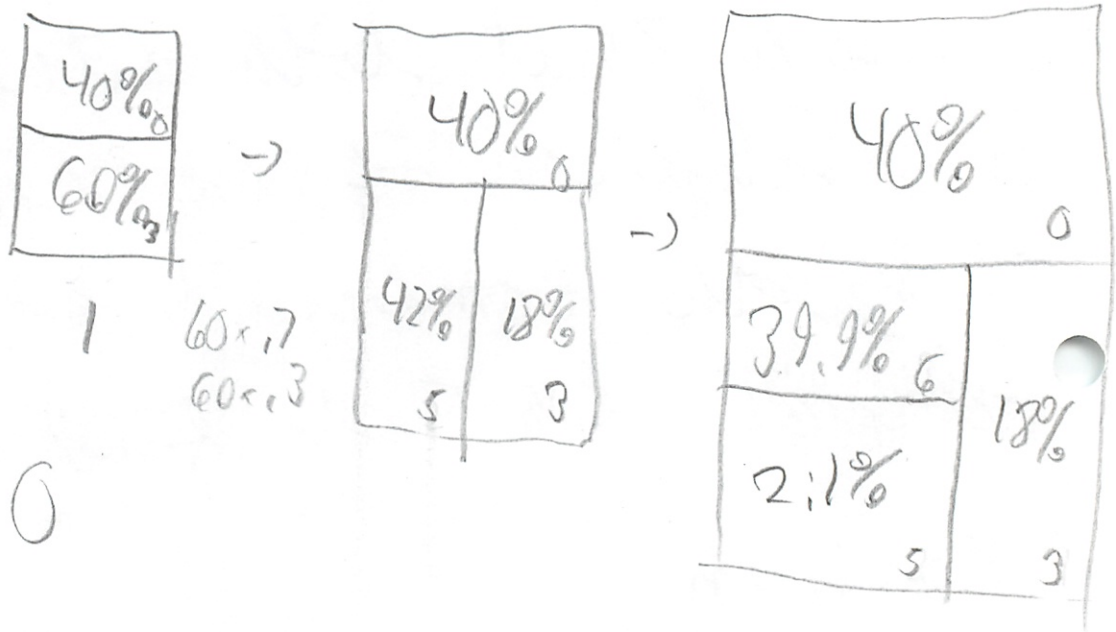
8) In Martian Football, extra points are much different. Your first extra point try is from the fifteen yard line and you get three points for making it. If you do make it, you now try a field goal from the ten yard line. If you make this one you get two points. When you make the second field goal, you now try from the three yard line for one point. If you make all three field goals you get six extra points (3 from 15 yards, 2 from 10 yards and 1 from 3 yards). Any time you miss, your extra point attempt is over. Your total extra points is the sum of the field goals you made. {15 pts}

Coach Gallagher makes 60% of his kicks from 15 yards, 70% of his kicks from 10 yards and 95% of his kicks from 3 yards.

a) What is Coach Gallagher's expected value for ~~extra~~ points in Martian Football?

b) If Coach Gallagher has 10 extra point attempts in a game, how many points would you expect the Coach to make?

Try	Pts	%
1	3	60
2	2	70
3	1	95



Prob × pts × Turns

$\frac{40}{100} \times 0 \times \frac{100}{1} = 0$

$\frac{18}{100} \times 3 \times \frac{100}{1} = 54$

$\frac{2.1}{100} \times 5 \times \frac{100}{1} = 10.5$

$\frac{39.9}{100} \times 6 \times \frac{100}{1} = 239.4$

$303.9 / 100 = 3.039$ EV Per turn

b. $3.039 \times 10 = 30.39$ ~~30~~ points EV for 10 turns