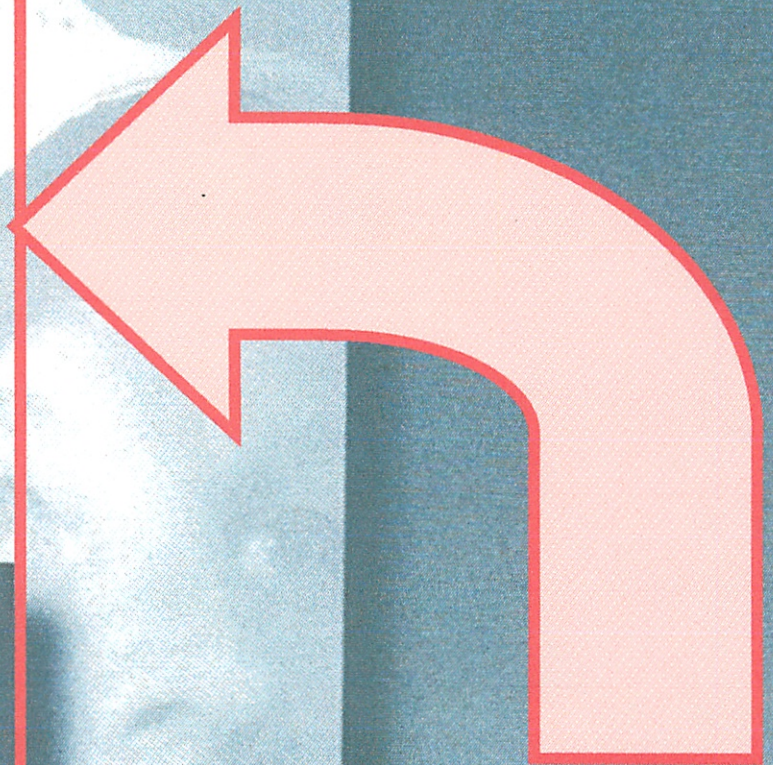


The Game of Pig



Pig at Home (#1)

Michael Plasmeier

who

How taught

Strategies

Play w/ or against each other

Calc Program

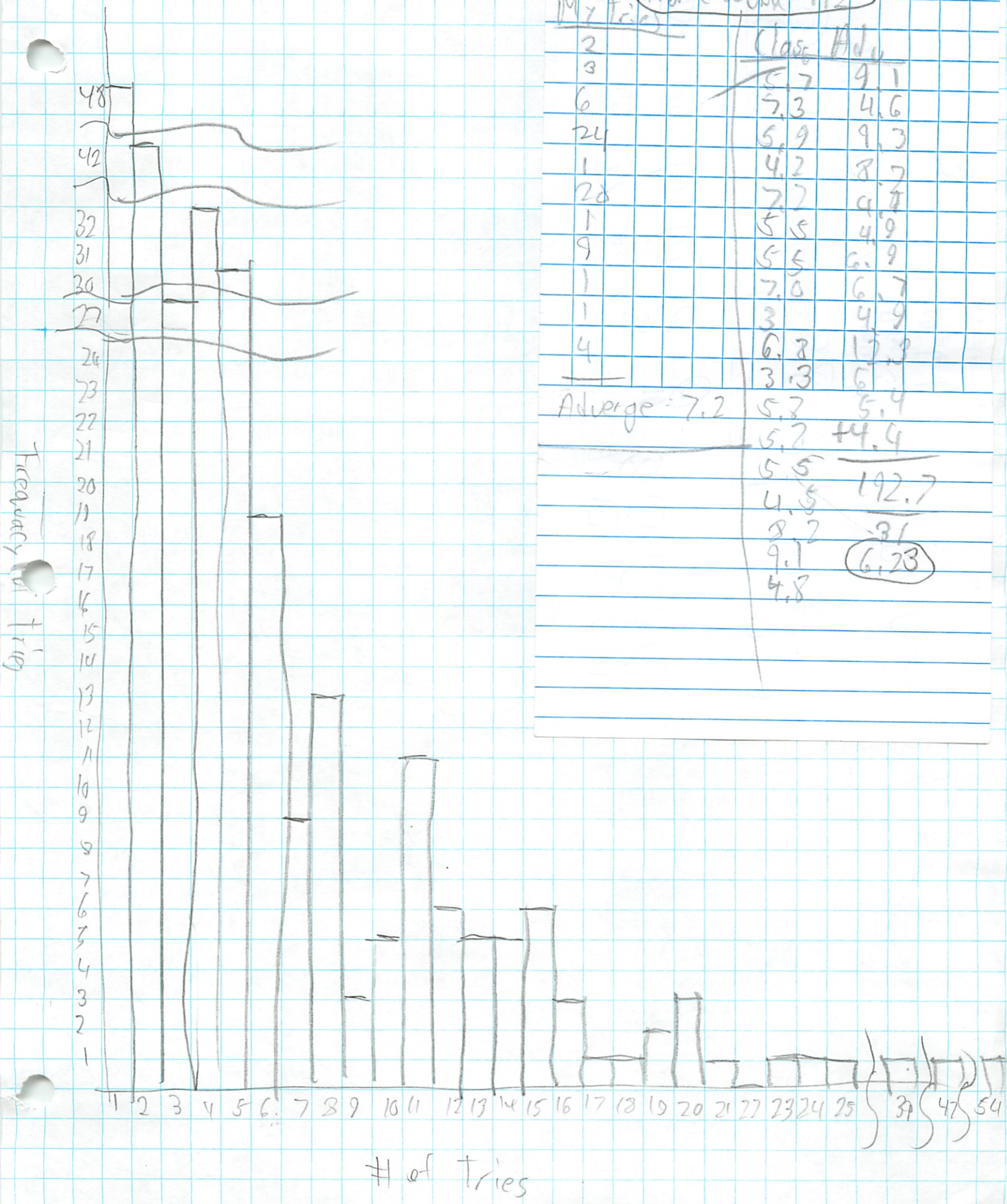
I played Pig with my calculator trying to get a high score and see how I could do. I programmed the game into the calculator. In class I did bad at the game because I stopped too early at 10. I now stop when I get over 20. I tried this and got 43 pts. in 6 turns stopping at 20. I tried stopping when I got over 10, and I only got 21 pts. in 6 turns. I then did 30. I got 63 pts. in 6 turns. So it seems like you should try and go high.

15-51	- 10	21	} 6 turns
	20	43	
15-16	30	63	
	40	40	
	50	52	

In the long run

Homework #12

<u>M</u>	<u>Tries</u>	<u>Class</u>	<u>Adv</u>
2		5.7	9.1
3		5.3	4.6
6		5.9	9.3
24		4.2	8.7
1		7.7	9.7
28		5.5	4.9
1		5.5	6.9
9		7.0	6.7
1		3	4.9
4		6.8	17.3
		3.3	6
Average = 7.2		5.7	5.4
		5.7	14.4
		5.5	192.7
		4.5	
		8.2	31
		9.1	6.23
		4.8	



Gambler Fallacy

T H H H H H H T T H T H T F

T H T T H T H H H T H T H

Same - ~~HH~~ | (6)

Diff - III | (3)

1.

H H T T H H H H T H T H H H
T H T H H H H H H H T

Same III (5)

Diff III (3)

2.

H H H H H H T H H H T T H T
H T H H T T H H H T T

Same III (3)

Diff III (3)

Homework #3 Expecting the Unexpected

Michael Plasmeier

16th
19 T
31 H

2nd
18 T
37 H

2. Largest
35, 36
Smallest
15, 7

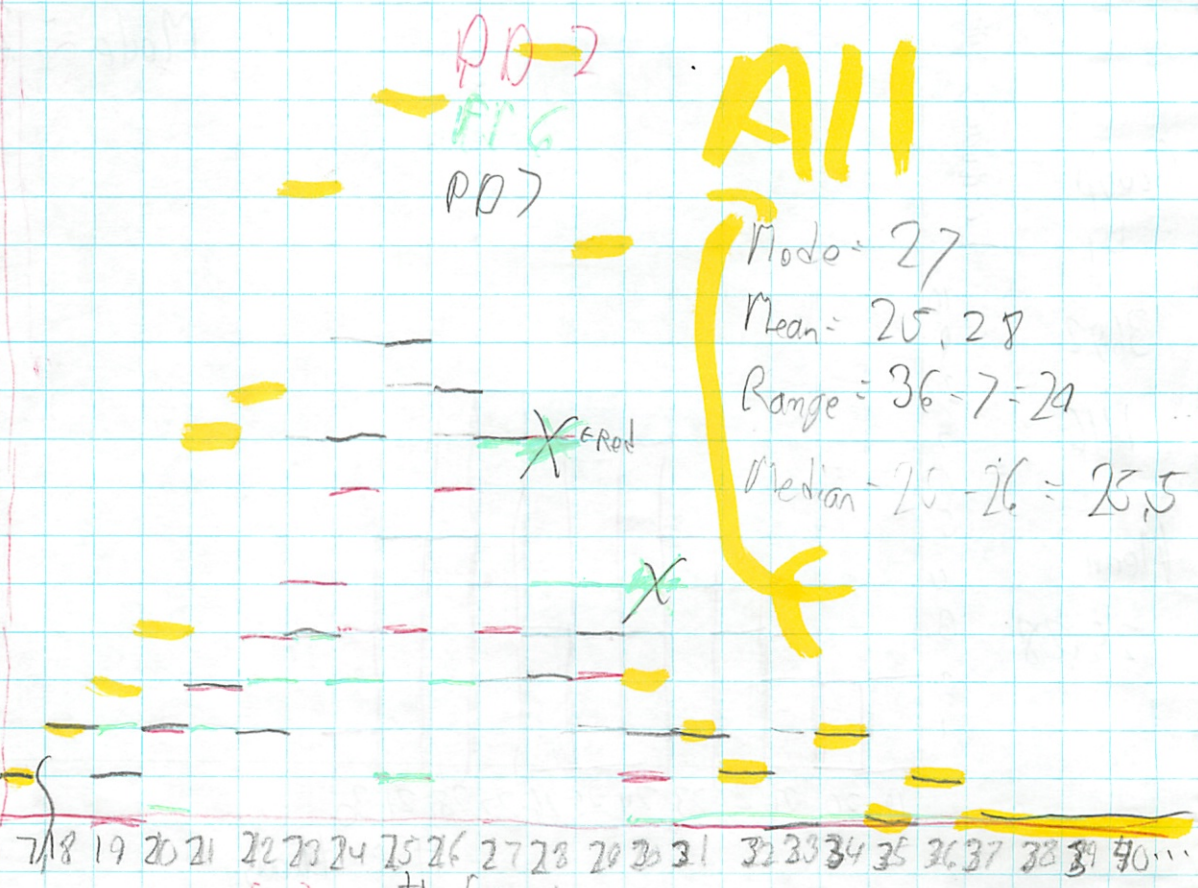
26 $\frac{1}{10}$ times

7	1
19	1
20	2
21	3
22	2
23	5
24	8
25	10
26	4
27	8
28	3
29	4
30	2
31	2
32	1
34	34
36	36

Frequency of # of heads

\bar{x} = mode
min \bar{x} = minimum
Med = median
max \bar{x} = maximum
no mode \rightarrow look on graph

Histogram



Median 25

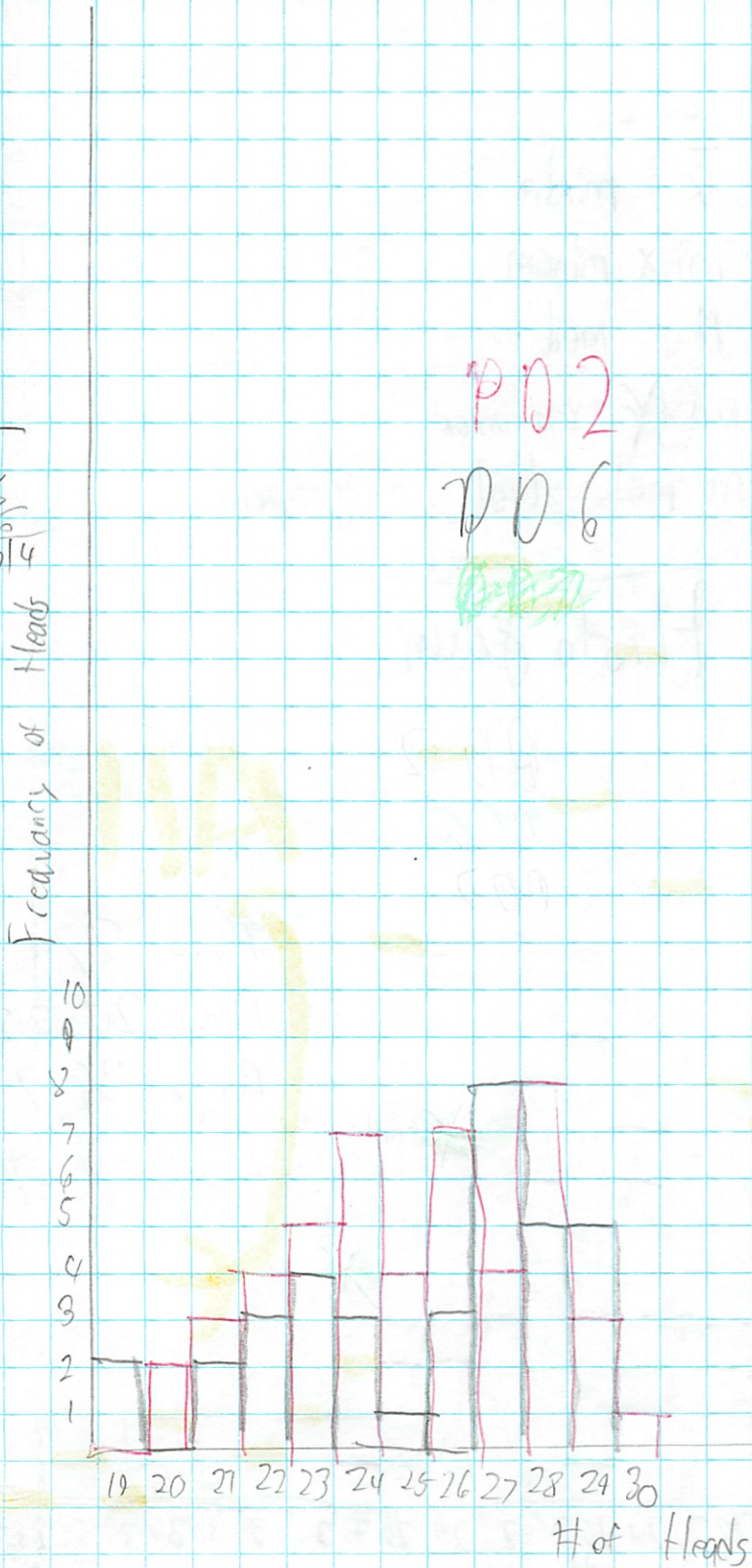
(\bar{x}) # of heads

mean 25,37 mode 25 Range 36 - 7 = 29

Total: 1578 / 62

PD 7	PD 6
19	0
20	2
21	3
22	4
23	5
24	7
25	4
26	7
27	4
28	8
29	8
30	5
31	3
32	1
Σ	91
1205	914

Group
total
3692
146
Mean
25.28



PD 2

Mean = 26.104

Median = 25

Mode = $\frac{24 + 26}{2}$ Do average of this

PD 6

Mean = 25.388

Median = 26 (27)

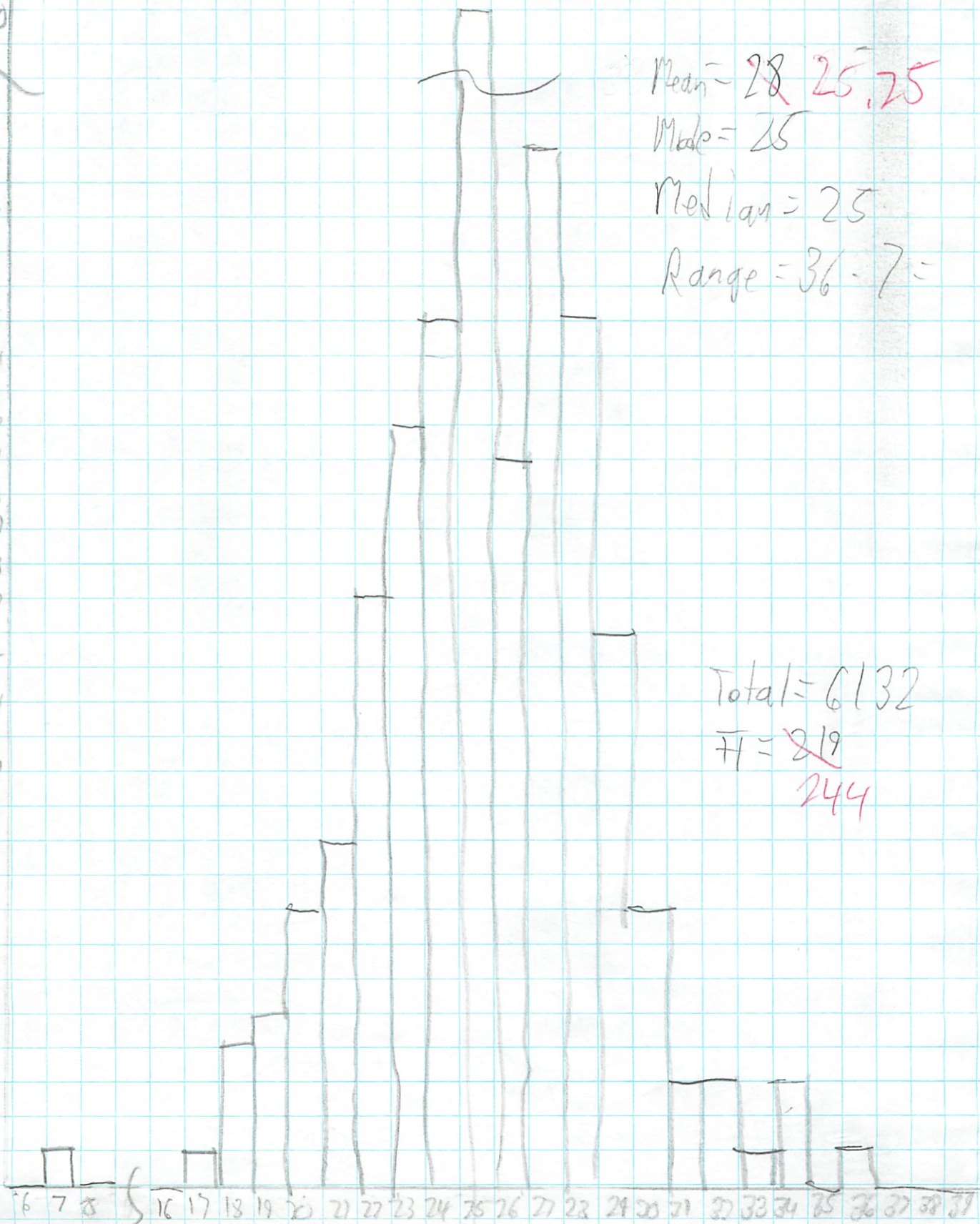
Mode = 27

PD 2
PD 6

Heads, Mr Traboth + O'Gaddy

41
40
39
31
30
29
28
27
26
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1

Frequency



Mean = ~~28~~ 25.25
 Mode = 25
 Median = 25
 Range = 36 - 7 =

Total = 6132
~~71 = 219~~
 244



of Heads

0 to 1 or Never to All was

Michael Plasmior

(F13)

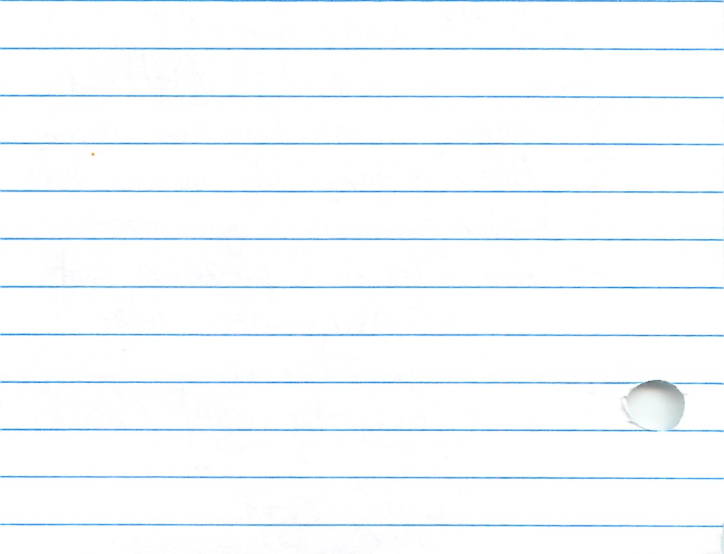
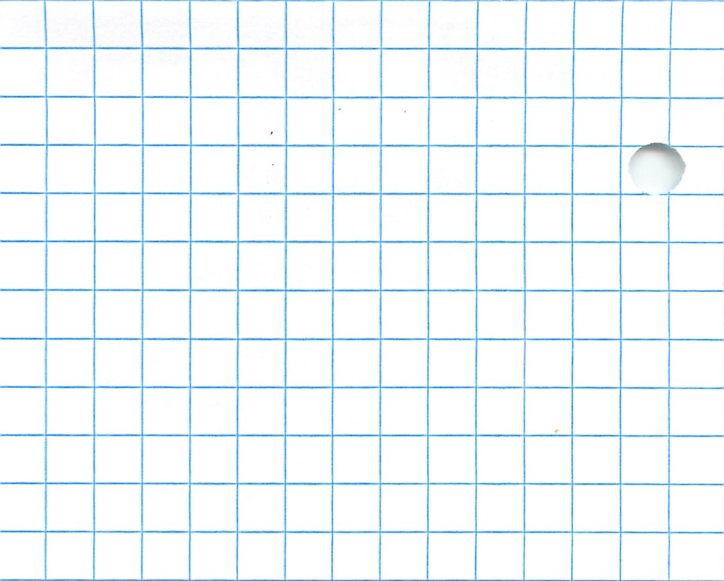
11/11

1. 0 Having no homework for the year
Picking Green out of a bag w/ 2 Yellow + 3 Blue
2. $\frac{2}{7}$ Getting a B on a test for me
Picking green w/ 2 Green 3 Blue 2 Red
3. 75% Me Getting an A in class
Spinning a spinner \rightarrow  + land on white
4. 1 Having homework for the homework
Find Red on American Flag
5. 2.3 Snowdays during the year
Having a spinner land black 
w/ 5 turns
6. .01 Being picked out of 7-8th grade at HHS
Prob. of $\frac{1}{1000}$ - Picking a gumball out of machine w/ 1000.

0, $\frac{2}{7}$, 75%, 1, 2.3, .01

Homework #4 Coincidence + Causation

1. Greater, because her Betting Advantage increases for those games. For Beginning games, she may of had a broken arm; Just got more training. Although 3 previous hits does not guarantee another one.
2. Equal, the man has nothing to do with how the light changes.
3. The same, unless ^{man comes at same time each time} the supply truck hit a bumpy road, or she drops it.



Paula's Pizza #5

Michael Plasmolier

11/18

1. SO - OM - MT - TL / LP
 SM - OT - **ML** - IP
 ST - OL - MP
 SI - OP
- S = Sausage
 O = Onions
 M = Mushrooms
 T = Pepperoni
 L = Olives
 P = Peppers
- Wants (yellow highlight)
 Likes (pink highlight)

$$5 + 4 + 3 + 2 + 1 = 15 \text{ combos}$$

2. $P\left(\frac{1}{15}\right)$ Wants

$P\left(\frac{14}{15}\right)$ Not Want

$$P(A) = \frac{1}{15}$$

$$P(\sim A) = \frac{14}{15}$$

\sim = Not

$$P(A) + P(\sim A) = 1$$

$$\frac{1}{15} + \frac{14}{15} = \frac{15}{15} = 1$$

3. $P\left(\frac{6}{15}\right)$ Likes

$P\left(\frac{9}{15}\right)$ Not Like

$$P(L) = \frac{6}{15}$$

$$P(\sim L) = \frac{9}{15}$$

Formula

$h \binom{r}{r}$

Combo of h items taken r times

h = items
 r = times

$$\frac{h!}{r!(h-r)!}$$

$$\frac{6!}{2!(6-2)!}$$

$3 \times 2 \times 1 = 6$

$4 \times 3 \times 2 \times 1 = 24$

$2 \times 1 = 2$

1

Baskin Simulator

$$31 \binom{2}{2}$$

31 flavors
2 at a time
no repeats
no doubles

$$\frac{31!}{2! \times (31-2)!}$$

$$\frac{31!}{2 \times 29!}$$

$$\frac{31 \times 30}{2} = 15$$

465

What are the Chances

p 110 1111

A 1. $P \frac{1}{2}$ $P \frac{2}{9}$

B 2. $P \frac{1}{1000}$

C 3. $P \frac{1}{50}$ $P \frac{99}{100}$ Don't know New Zealand Always certain

D 4. HH $P \frac{1}{2}$
HT
TH
TT

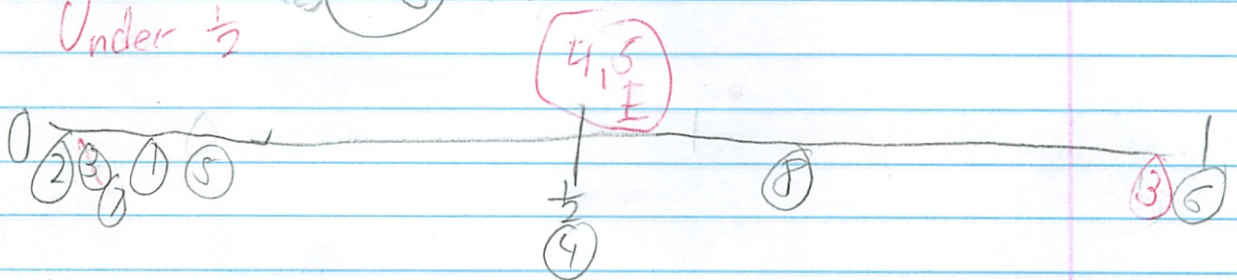
F Forgot this problem
F 5. $P \frac{1}{2}$? Hard

G
A 6. $P 1$

I 7. $P \frac{6}{27} = P \frac{2}{9}$

J 8. B.H. role 2 examples $(P \frac{2}{3})$
Under $\frac{1}{2}$

11	22	33	44	55	66
12	23	34	45	56	
13	24	35	46		
14	25	36			
15	26				
16					

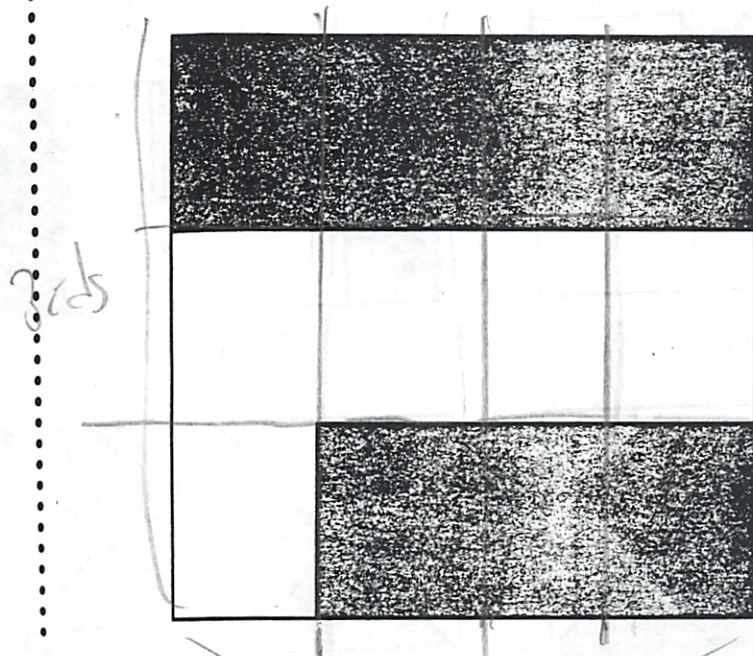


Rug Games

Imagine that each diagram in this activity represents a rug. A trap door opens directly over the rug and a dart falls down, landing at random somewhere on the rug.

"At random" means that every point on the rug has as good a chance of getting hit as every other point.

1. If you were trying to predict which part of this rug will get hit, which color would you choose, gray or white? What is the probability of being hit for each color?



$$\frac{7}{12} = P(\text{Black})$$

$$\frac{5}{12} = P(\text{White})$$

Continued on next page

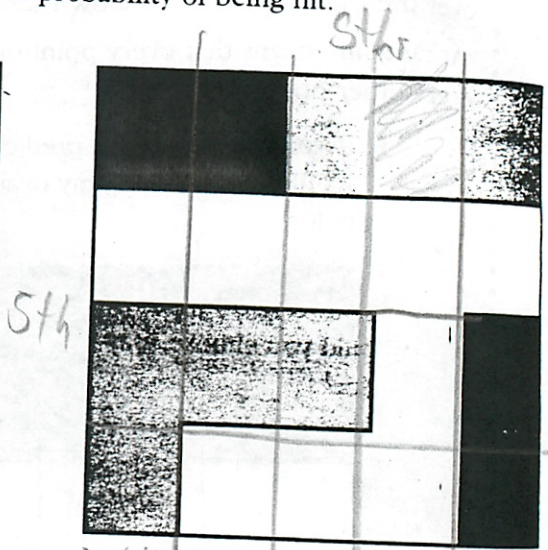
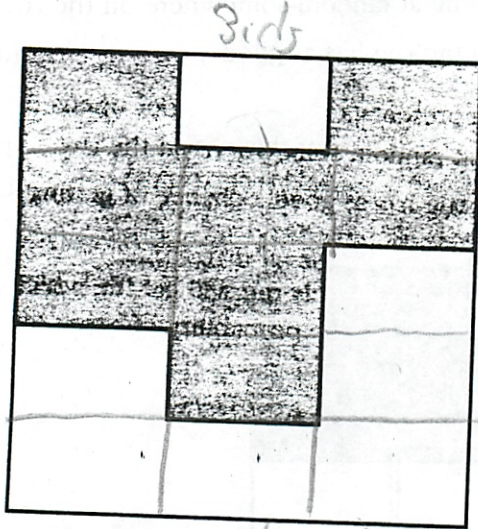
2. For each of the rugs below, decide which color you would predict as most likely to be hit. For each color, find the probability of being hit.

B: White

$$P(\text{White}) = \frac{9}{20}$$

$$P(\text{Black}) = \frac{4}{20} = \frac{1}{5}$$

$$P(\text{Gray}) = \frac{7}{20}$$



White
Black

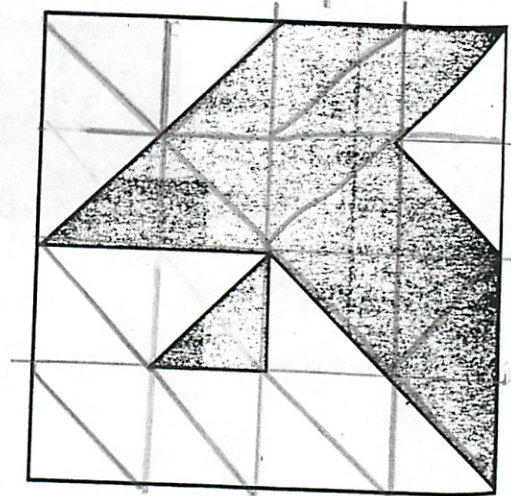
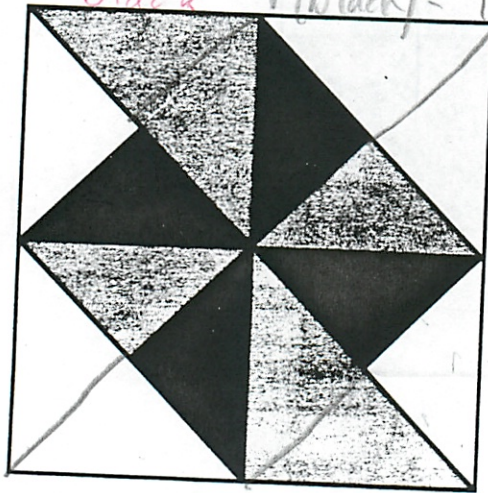
A

$$P(\text{White}) = \frac{7}{15}$$

$$P(\text{Black}) = \frac{4}{15}$$

White

B



Reduce
Fractions

White + Gray

$$P(\text{White}) = \frac{6}{16}$$

$$P(\text{Gray}) = \frac{6}{16}$$

$$P(\text{Black}) = \frac{4}{16}$$

White

D

$$P(\text{White}) = \frac{17}{32}$$

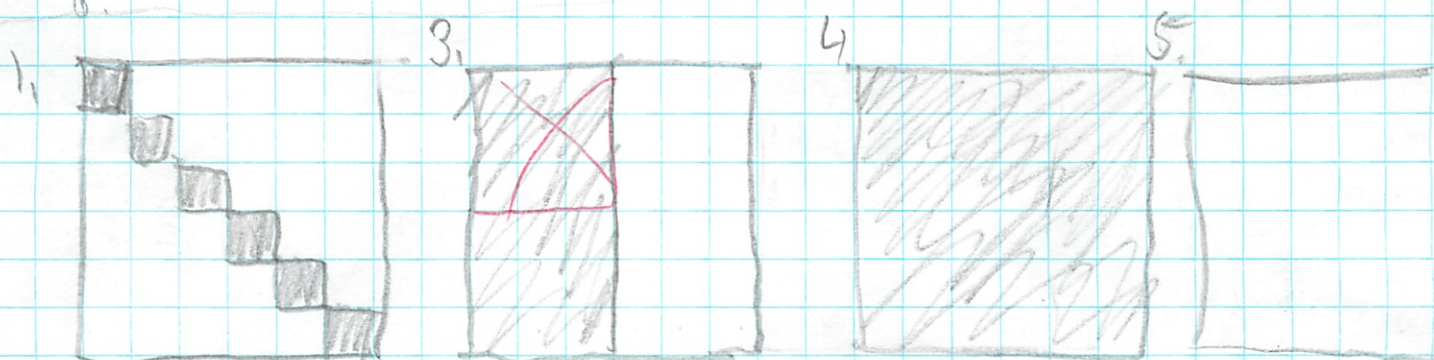
$$P(\text{Gray}) = \frac{13}{32}$$

Michael Plasmeier

Homework #7

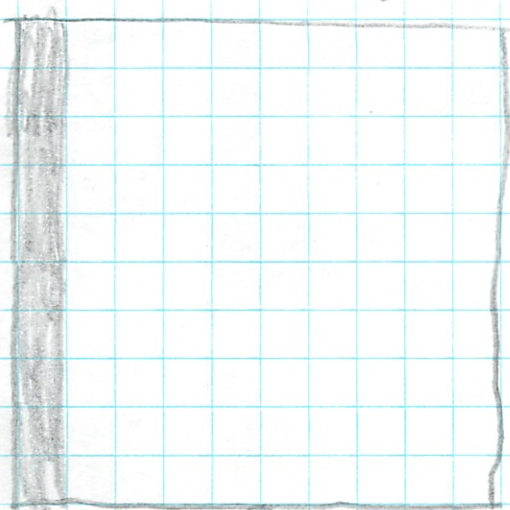
1. $P(\text{Rolling } 6) = \frac{1}{6}$

There are 6 sides on a die. Only 1 side has a 6.

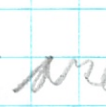


2. $P(\text{Chosen}) = \frac{3}{30} = \frac{1}{10}$

3 of 30 is also 1 of 10 if you reduce it



3. $P(\text{2 heads}) = \frac{2}{4} = \frac{1}{2}$
not doubles



are the 4 combos

4. $P(\text{sum}) \uparrow$ It will rise } opposite

5. $P(\text{no homework}) = 0$ We going to happen

Describe Situation

6. $\frac{7}{4}$

7. $\frac{1}{4}$

8. $\frac{1}{2}$

9. $\frac{10}{52}$

1. There are 7 cubes in a bag. 2 are blue, 5 are Red
 $P(B)?$
 2 Day in a week Pick day starts w/ 5

2. There are 100 cubes, 25 are Red, 40 are Green, 35 Black
 2nd Outcome, 1st Outcome

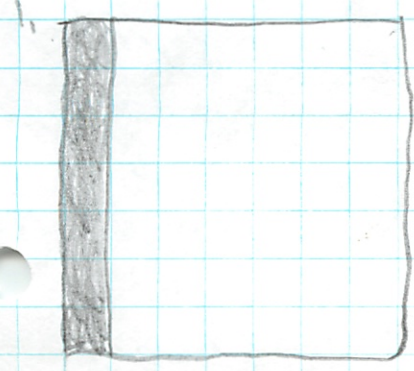
3. 100 cubes, 50 Orange, 25 Gray, 25 Black
 1st Outcome, 2nd Outcome, 3rd outcome

Overlaps

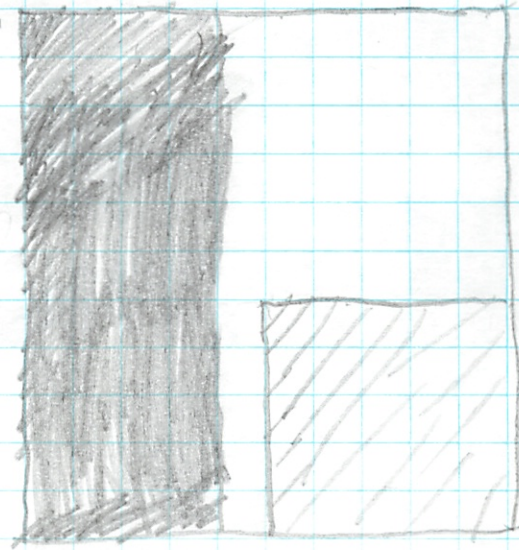
100 kids

50 soccer
 30 VB
 20 Hockey

5 VB + Hockey



Outcome 1
 Outcome 2



Outcome 1
 Outcome 2
 Outcome 3



Outcome 1
 Outcome 2
 Outcome 3
Had extra

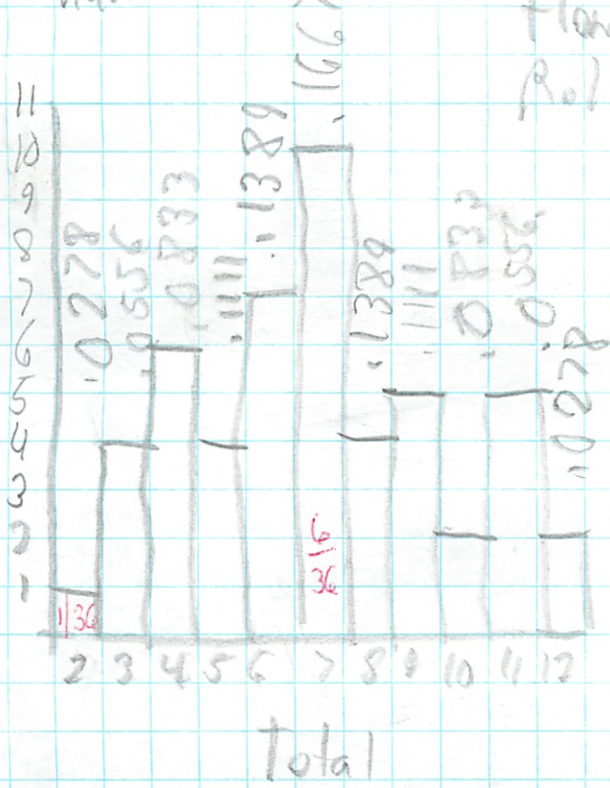
Michael Placencia

Home work #9

Rollin', Rollin'

Hierarchical

Y
2
3
4
5
6
7
8
9
10
11



1+1=2 - 1

1+2=3) 2

2+1=3

1+3=4

2+2=4) 3

3+1=4

1+4=5

2+3=5) 4

3+2=5

4+1=5

2=1

3=2

4=3

5=4

6=5

7=6

8=5

9=4

10=3

11=2

12=1

- I got this data because I already know weight possibilities and I programmed this in. This is a roll using those.

3. I already knew that.

Blue

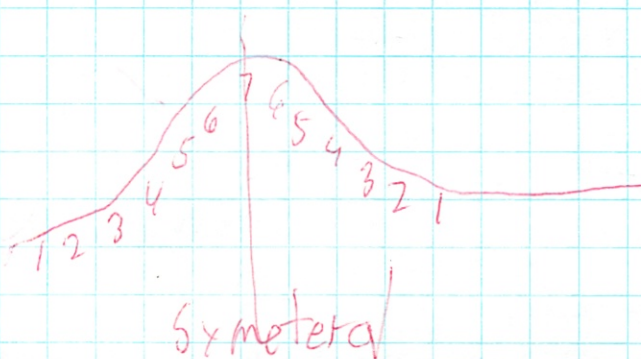
Blue Die

1 2 3 4 5 6

Green Die

1 2 3 4 5 6

	1	2	3	4	5	6
1	1,1	1,2	1,3	1,4	1,5	1,6
2	2,1	2,2	2,3	2,4	2,5	2,6
3	3,1	3,2	3,3	3,4	3,5	3,6
4	4,1	4,2	4,3	4,4	4,5	4,6
5	5,1	5,2	5,3	5,4	5,5	5,6
6	6,1	6,2	6,3	6,4	6,5	6,6



2 Dice Sums

(M)

2-7	9	7	9	8 8	6	46
3-12		14	14	16 16	16	92
4-22	19	30	20	26	15	156
5-38	32	38	28	38	34	206
6-42	41	46	48	34	41	257
7-44	56	44	5	5	59	50
8-49	23	39	44	36	33	318
9-38	32	31	37	33	18	245
10-18	15	24	20	22	4	192
11-24	8	22	11	22	6	135
12-6	8	5	7	7		116
						37

2	233
3	451
4	673
5	939
6	1169
7	1434
8	1118
9	422
10	664
11	542
12	222

6 groups

2 Dice Sums + Products

Michael Plasencia

#11

11/21

1. $2+4+6+4+2=18$ Odd

$1+3+5+5+3+1=18$ Even

They are both equally likely because even has more # but odd's are higher.

2. What is the probability of each #.

2	3	4	5	6	7
8	3	4	5	6	7
2	9	4	5	6	7
8	9	10	5	6	7
8	9	10	11	6	7
18	9	10	11	12	7

Each num has $\frac{1}{36}$ with #
increasing each

2b. Add the opposit of the sum ex $2+12=14$
 $3+11=14$

2	4	5	9	6	7
12	4	5	9	6	7
3	4	5	9	8	7
3	10	5	6	8	7
11	10	9	6	8	7
11	10	9	6	8	7

x	1	2	3	4	5	6
1	1	2	3	4	5	6
2	2	4	6	8	10	12
3	3	6	9	12	15	18
4	4	8	12	16	20	24
5	5	10	15	20	25	30
6	6	12	18	24	30	36

3.

1=1	4=3	8=2	13=	18=2	30=2	4 Odd=9 Even
2=2	5=2	9=1	14=	20=2	36=1	
3=2	6=4	10=2	15=2	24=2		

5a Draw a reg for $\times 2$ dice products

1	4	6	10	15	21
2	4	6	12	16	24
2	5	8	12	18	25
3	5	8	12	18	30
3	6	9	12	20	30
4	6	10	15	20	36

5b. Odd \checkmark Even

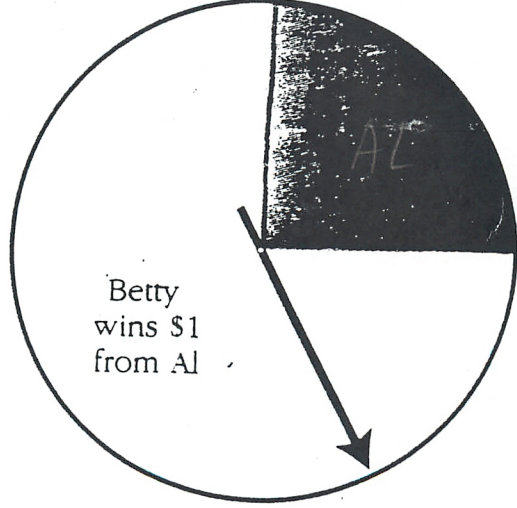
 = odd

 = Even

1. I think Al will have more money

Al	Betty
28	18
24	19
28	18
28	18
100	73

Spinner Give + Take



Michael Plasmeier

Al is \$35 ahead

4 turn 100 turns
 AL = 1 spot, \$4
 Betty = 3 spots, \$3

100 | 75

1. long run
 2. 25 times
 3. 100 turns
- How far ahead

4:3
 T
 Al Betty

1. I think that all will have more money.

2.



Pointed Rugs (#12)

Michael Plasmeier

pl) pts Turns

11/30

1. Gray 8/15 $8 \times 6 = 48$ pts $\frac{8}{15} \times \frac{8}{1} \times \frac{15}{1} = 48$

(White) 7/15 $7 \times 8 = 56$ pts $\frac{7}{8} \times \frac{8}{1} \times \frac{15}{1} = 56$

2. White would get more because it would win 7 times, 1 more than 6, but it gets 2 more pts.

2. Black 4/20 $4 \times 6 = 64$

(White) 9/20 $9 \times 8 = 72$

Gray 7/20 $7 \times 10 = 70$

Probability \times Pts per Turn \times Turns

9 pts answer

White again wins because it has so many possibilities which put out a low points.

3. White 6/18 $6 \times 5 = 30$

Gray 6/18 $6 \times 6 = 36$

(Black) 4/18 $6 \times 10 = 60$

Black wins because of its overwelling points

4. Gray 18/32 $18 \times 15 = 225$

(White) 17/32 $17 \times 13 = 221$

White wins as it has lots of possibilities

Fair Rug #14

Michael Plasmeier

12/2

1. Black $9/15$ $\frac{9}{15} \times \frac{15}{1} \times \frac{3}{1} = \27 | Tony $\$1.8$ per turn

White $6/15$ $\frac{6}{15} \times \frac{15}{1} \times \frac{5}{1} = \30 | Christal $\$2$ per turn

No it is not fair because Christal gets 30¢ in 15 turns and Tony only has 3 dollars less. (w/ \$27)

2. you should change Black to about 3.33 and round up.

Not equal \rightarrow Need change both

$$\begin{array}{r} 29 \\ \times 38 \\ \hline 232 \\ 2997 \\ \hline \end{array}$$

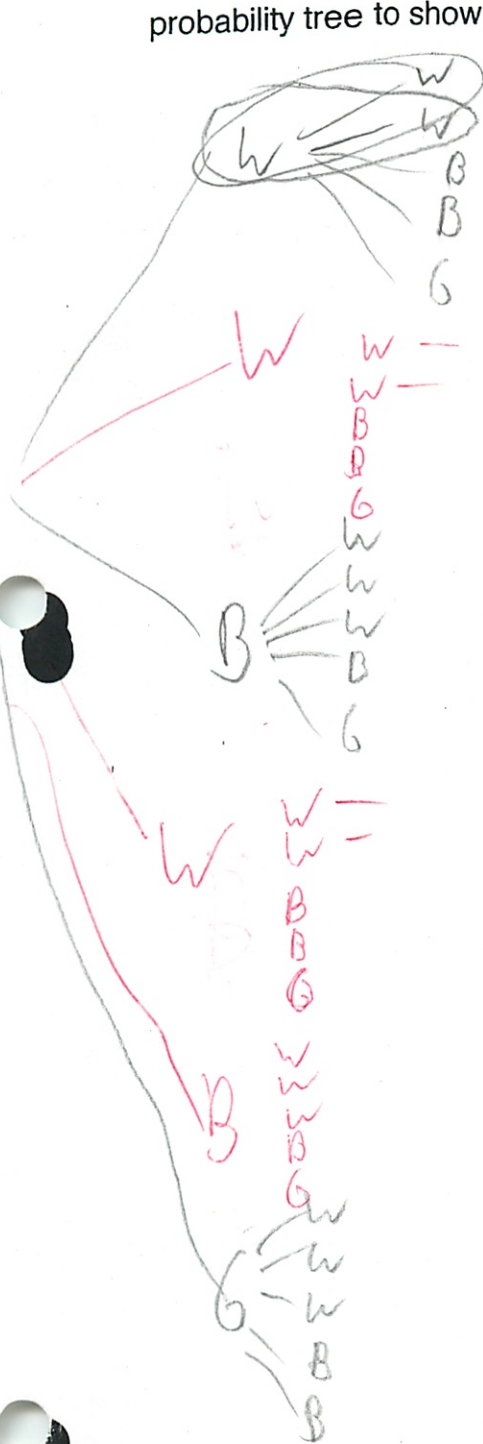
$$\begin{array}{r} \text{Tony} \quad | \quad 3.4 \quad 9 \\ \hline \text{Christal} \quad | \quad 5 \quad 16 \quad 6 \end{array}$$

Expected Value per turn

Worksheet

Name Michael Plasme '08

If you have a drawer of socks, with 3 white socks, 2 black socks and 1 green sock, and you pick out 2 socks, one at a time, what is the $P(2 \text{ white socks})$? Use an area model or probability tree to show your work.



$$\frac{2}{15}$$

Did it once
not 1st time

$$\frac{6}{30} = \frac{1}{5}$$

	W ₁	W ₂	W ₃	B ₁	B ₂	G
W ₁	XXXX	✓	✓			
W ₂	✓	XXXX	✓			
W ₃	✓	✓	XXXX			
B ₁				XXXX		
B ₂					XXXX	
G						XXXX

← cross out middle

Name Michael Plampier

PROBABILITY WORKSHEET

Find the probability of each event.

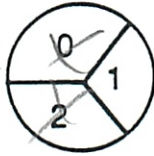
1. Rolling a die and getting a 7. 1. $\frac{0}{6}$
2. Rolling a die and getting a 5 or a 6. 2. $\frac{2}{6} = \frac{1}{3}$
3. Picking a spade from a standard deck of cards. 3. $\frac{13}{52}$
4. Picking a picture card (jack, queen, king) from a standard deck of cards. 4. $\frac{12}{52}$

5. Getting higher than a 4 on the spinner shown at the right. 5. $\frac{3}{5}$



(Assume that all divisions of the spinner are equal)

6. Getting an even number on the spinner shown at the right. 6. $\frac{2}{3}$



(Assume that all divisions of the spinner are equal)

7. Picking a 4 or a heart from a deck of cards. 7. $\frac{23}{52}$
8. Flipping a coin twice and getting tails twice. 8. $\frac{1}{4}$

9. If you flip a coin three times, you can get any of the following results: HHH, HHT, HTH, HTT, THH, THT, TTH, TTT.
- a. Getting exactly two heads. 9a. $\frac{3}{8}$
 - b. Getting at least two heads 9b. $\frac{4}{8} = \frac{1}{2}$
 - c. Getting at most two heads 9c. $\frac{7}{8}$
 - d. Not getting two heads 9d. $\frac{6}{8}$

$P(\text{not 2H}) = 1 - P(2H)$

Spins + Draws

$$1. \frac{1}{5} \times \frac{1.25}{100} \times \frac{100}{1} = 25$$

$$\frac{4}{5} \times \frac{30}{100} \times \frac{100}{1} = \$1.20/5 = 24k$$

13.75
11.7

$$\frac{1}{5} \times \frac{1.25}{1} \times \frac{5}{1} = \$1.25/5 = 25k$$

b. Al gets 1.25 instead Al: 1.20
Betty: 30

Gains.

$$2. A \frac{1}{10} \times \frac{20}{1} \times \frac{52}{1} = 80/52 = 1.54$$

$$B \frac{1}{4} \times \frac{8}{1} \times \frac{52}{1} = 104/52 = 2$$

Not for H

$$N \frac{1}{6} \times \frac{2}{1} \times \frac{52}{1} = 72/52 = 1.38$$

Pays Out

$$36 \text{¢} + 1.04 = 1.40$$

$$-60 \text{¢} \text{ so it net } 36 \text{¢}$$

$$36 \text{¢} + 80 = 1.16$$

$$-12 \text{¢} \text{ so } 1.04 \text{ net}$$

Need
Pay
Out

