Expected Value example

Rainfall

outcome	value	probability
no	0	5%
tiny	$\frac{1}{8}$ "	10%
medium	$\frac{1}{2}$ "	50%
lots	1 "	35%

Expected Value example

Rainfall

outcome	value		probability		product
no	0"	·	0.05	=	0
tiny	0.125"	·	0.10	=	0.0125
medium	0.5"	·	0.50	=	0.25
lots	1"	·	0.35	=	0.35
				+	
					0.6125"

Roulette

the wheel has 18 red pockets
18 black pockets
we bet here (only) → 1 green "zero" pocket
what is the fair payout if we win?

outcome	value		probability		product
lose	-1	$\cdot$	$\frac{36}{37}$	$=$	$-\frac{36}{37}$
win	$\frac{y}{1}$	$\cdot$	$\frac{1}{37}$	$=$	$\frac{y}{37}$
				$+$	
					0

so $\frac{y}{37} - \frac{36}{37} = 0$

so $\boxed{y = \$36}$

Percent HW

19. You are going to be the instructor of a Biology class and need to write the syllabus. You want attendance to be worth 10%, the final exam to be worth 30%, and the rest divided between nine lab reports and two midterms with each midterm worth as much as three lab reports. How much is each lab report worth? How much is each midterm worth?

attendance 10%

final 30%

nine lab reports each is 4%

midterm #1 each is 4% · 3 = 12%

midterm #2

= 15 lab reports (each midterm = 3)

60%

100%

15 lab reports = 60%

÷15 ÷15

1 lab report = 4%

cost?

will change

14. A student is about to take a final exam with 38 problems, each worth one point. His grades so far in the class are listed below. How many problems does he need to get correct to earn an overall grade of 70% in the class?

Item	Score	% of Grade
Attendance	79%	14%
Homework	91%	19%
Midterm #1	59%	11%
Midterm #2	62%	11%
Final	?? %	45%

15. A restaurant meal that serves 4 people has $34 food cost, $38 labor cost, and $20 other cost. What price per plate should the meal be assigned according to the *food cost percentage method* with a 38% scale factor? What price per plate should the meal be assigned according to the *desired profit method* with a 14% desired profit?

16. Scrooge McDuck has an investment that appreciates 3% the first year. The next year the investment depreciates, and is worth what he started with. What is the second year's percent change?

show answers

From Percent Test

save for last

14. A student is about to take a final exam with 38 problems, each worth one point. His grades so far in the class are listed below. How many problems does he need to get correct to earn an overall grade of 70% in the class?

Item	**Score**	**% of Grade**
Attendance	79%	14%
Homework	91%	19%
Midterm #1	59%	11%
Midterm #2	62%	11%
Final	**??** %	45%

(Outcome) Item	(Value) Score		(Probability) % of Grade		Product
attendance	79	·	0.14	=	11.06
homework	91	·	0.19	=	17.29
midterm 1	59	·	0.11	=	6.49
midterm 2	62	·	0.11	=	6.82
Final	y	·	0.45	=	28.34 ← 70 − 41.66

sum is 41.66

\+

70 goal in class

So $y \cdot 0.45 = 28.34$

$\div 0.45 \quad \div 0.45$

$y \approx 63$ % on final exam

From Percent Test

save for last

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Midterm #2	62%	11%
Final	**??** %	45%

we left of knowing 63% needed on final

so... $\frac{\text{what}}{\text{part}}$ is $\frac{63}{\quad}$ % of $\frac{38}{\text{whole}}$?

$y = 0.63 \cdot 38$

$y \approx$ 24 problems correct

↑ round up

From Percent Test

13. A recipe that makes 24 servings requires 9 pounds of carrots. Carrots have a yield percent of 81%. How many carrots should you purchase if you are scaling up the recipe to make 239 servings? If carrots costs $0.51 per pound, what will they cost?

Step 1 – Scale Recipe Up

$$\frac{24 \text{ servings}}{9 \text{ pounds}} = \frac{239 \text{ servings}}{y \text{ pounds}}$$

$$y \cdot 24 = 9 \cdot 239$$

$$y \cdot 24 = 2{,}151$$

$$\div 24 \qquad \div 24$$

$$y \approx 90 \text{ pounds}$$

From Percent Test

13. A recipe that makes 24 servings requires 9 pounds of carrots. Carrots have a yield percent of 81%. How many carrots should you purchase if you are scaling up the recipe to make 239 servings? If carrots costs $0.51 per pound, what will they cost?

Step 2 - Yield Percent

want 90 lbs of carrots in pot

shop for $90 \div 0.81 \approx 111$ lbs

Step 3 - Cost

$111 \text{ lbs} \cdot \$0.51 = \boxed{\$56.61}$

End of Class Quiz

13. A recipe that makes 28 servings requires 10 pounds of carrots. Carrots have a yield percent of 81%. How many carrots should you purchase if you are scaling up the recipe to make 103 servings? If carrots costs $0.59 per pound, what will they cost?