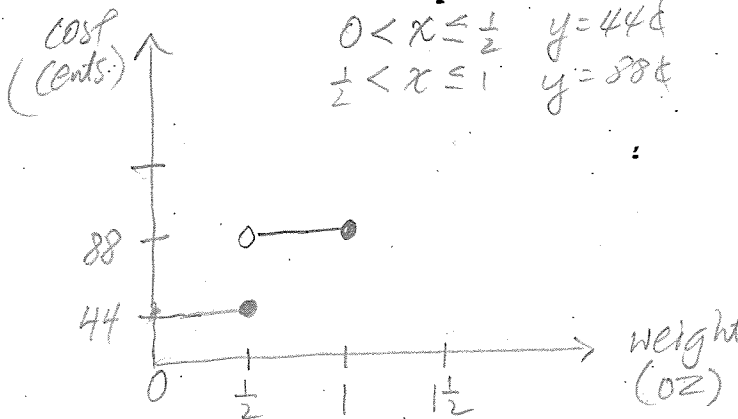


Name KBY
 Advanced Algebra (H) Step Functions

(ceiling function)

In 1985, the airmail postage from the United States to Europe was 44¢ per $\frac{1}{2}$ oz. This means that the cost of a letter that weighed $\frac{1}{2}$ oz or less was 44¢. The cost of a letter that weighed a little more than $\frac{1}{2}$ oz. was 88¢. The cost remained 88¢ until the weight was over 1 oz. Graph this weight-cost relationship.

OZ.	#cents
0	0
$\frac{1}{4}$	44
$\frac{1}{2}$	44
\downarrow	88
\downarrow	88
1	88
\downarrow	$1\frac{1}{2}$

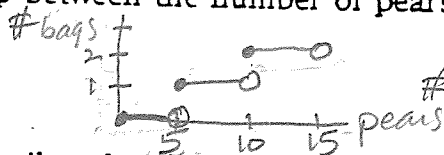


$$0 < x \leq \frac{1}{2} \quad y = 44¢$$

$$\frac{1}{2} < x \leq 1 \quad y = 88¢$$

pears	bags
0	0
1	1
2	1
3	1
4	1
5	1
6	2
7	2
8	2
9	2
10	2

2. A packaging machine in a supermarket puts 5 pears in each bag. Draw a graph that shows the relationship between the number of pears (p) and the number of bags (b).



Write an equation that describes the relationship. Use [] notation.

$$b = \left\lceil \frac{p}{5} \right\rceil$$

1. When Cory Graff is asked his age, he always answers with his age on his most recent birthday. Let x represent his actual age and y represent the age he gives.

$$y = \lceil x \rceil$$

2. Whenever Susan Rains accumulates 50 pennies, she puts them in a coin wrapper. Let x represent her number of pennies and y represent the number of wrappers used.

$$y = \left\lceil \frac{x}{50} \right\rceil$$

3. The cost C in dollars of making a call lasting m minutes during the day from Chicago, Illinois, to Paris, France, is given by the formula $C = 1.71 - 1.08 [1 - m]$.

a. Evaluate this formula when $m = 2, 7.5,$ and 10 .

b. Graph this equation for $0 < m \leq 10$.

$$C(10) = 1.71 - 1.08 [1 - 10]$$

$$= 11.43$$

$$a) C(2) = 1.71 - 1.08 [1 - 2]$$

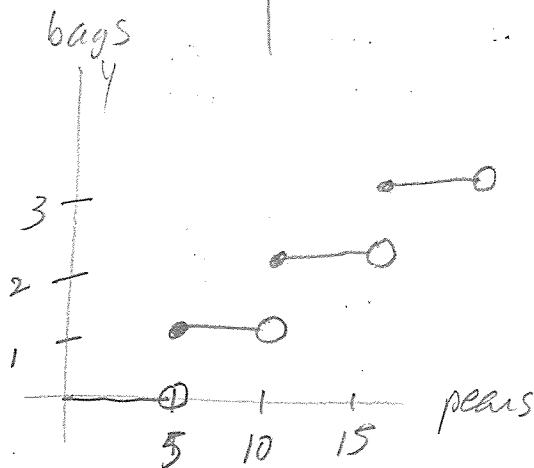
$$= 2.79$$

$$C(7.5) = 1.71 - 1.08 [1 - 7.5]$$

$$= 9.27$$

② Pears - Must have 5 pears in a bag.

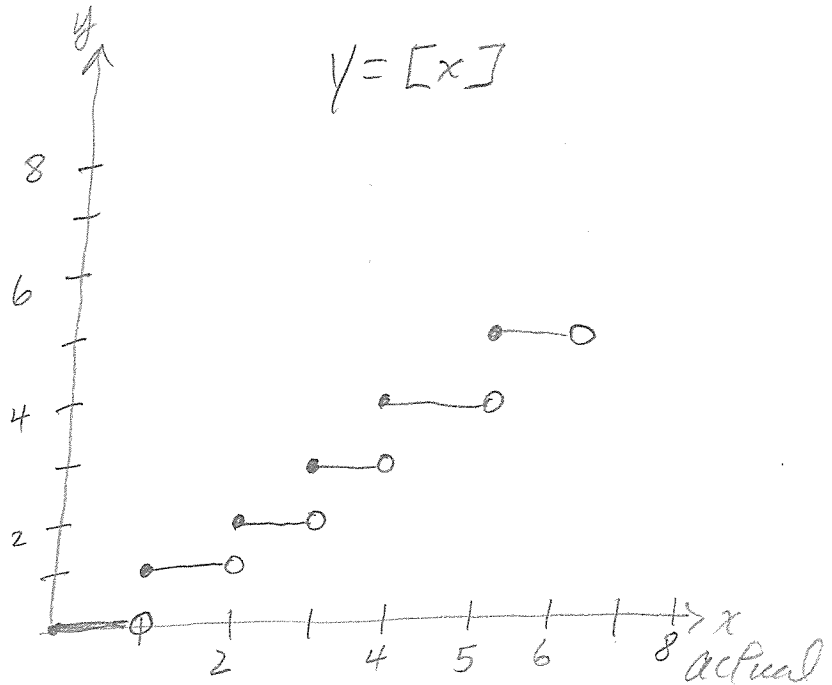
# pears	# bags	$\lceil \frac{p}{5} \rceil$	# bags
0	0	$\lceil \frac{4}{5} \rceil$	0
1	0	$\lceil \frac{5}{5} \rceil$	1
2	0	$\lceil \frac{6}{5} \rceil$	1
3	1	$\lceil \frac{7}{5} \rceil$	1
5	1	$\lceil \frac{8}{5} \rceil$	1
6	1	$\lceil \frac{10}{5} \rceil$	2
7	1		
8	1		
9	1		
10	2		



Step Functions

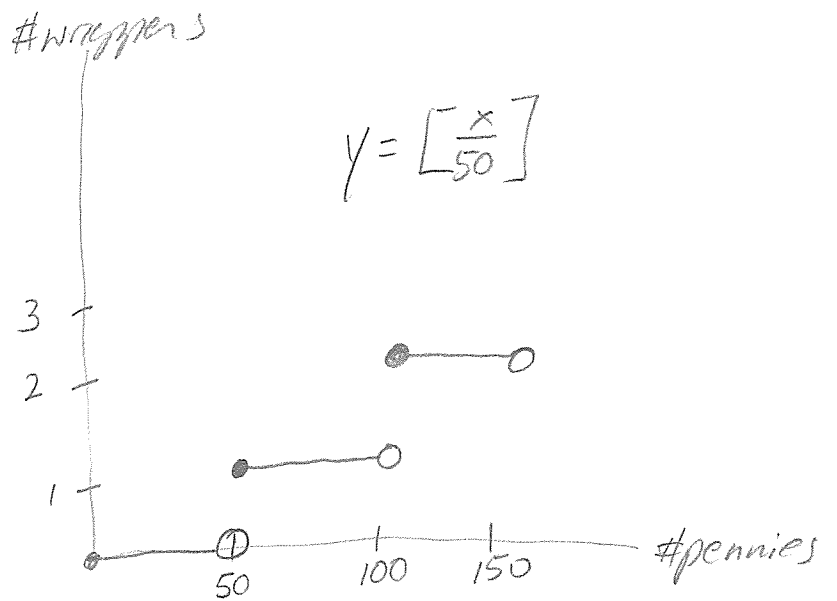
① Cory's birthday (actual) (he says)

X	Y
6	6
$6\frac{1}{2}$	6
$6\frac{3}{4}$	6
7	7
$7\frac{1}{2}$	7
$7\frac{3}{4}$	7
8	8



②

#pennies X	#wrappers Y
0	0
49	0
50	1
99	1
100	2



③

m	C
2	2.79
7.5	9.27
10	11.43

