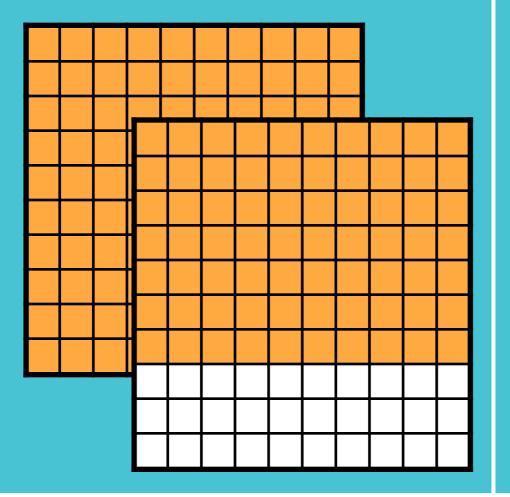
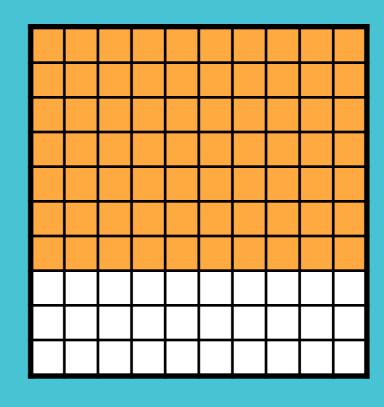
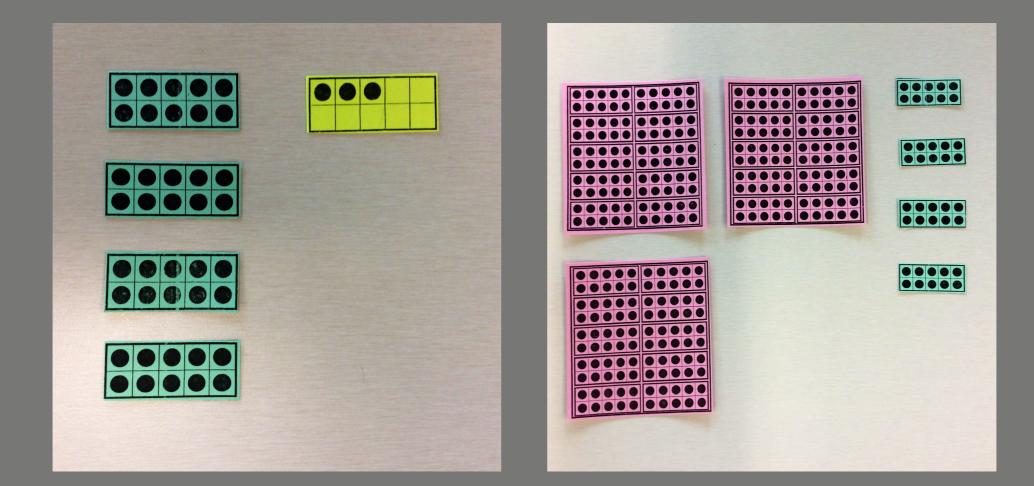


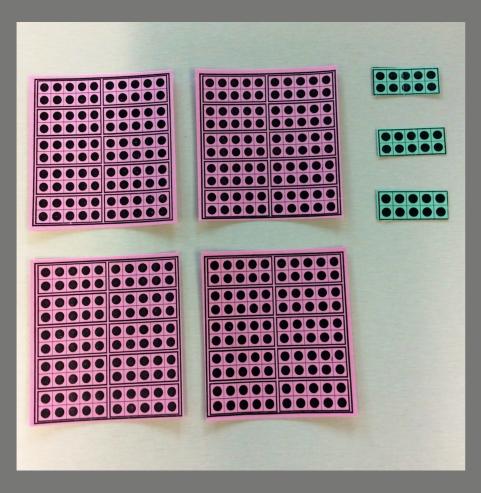
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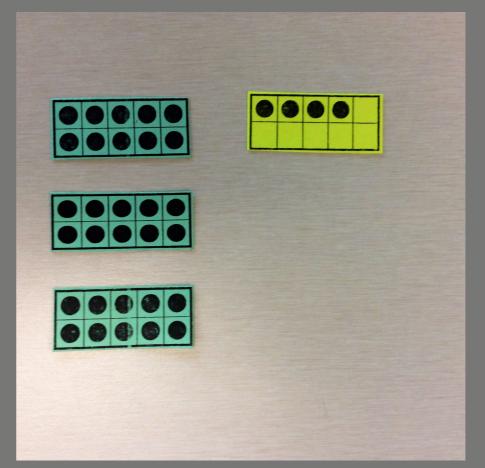


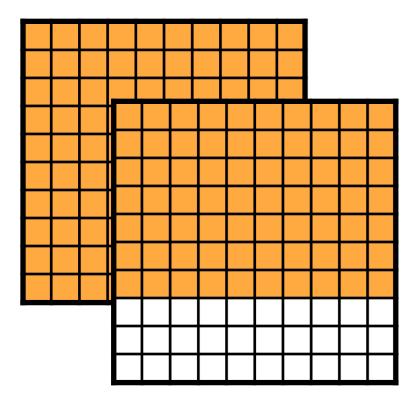


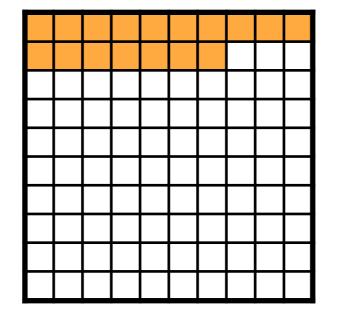
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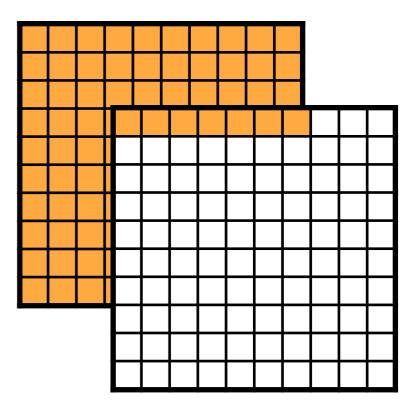


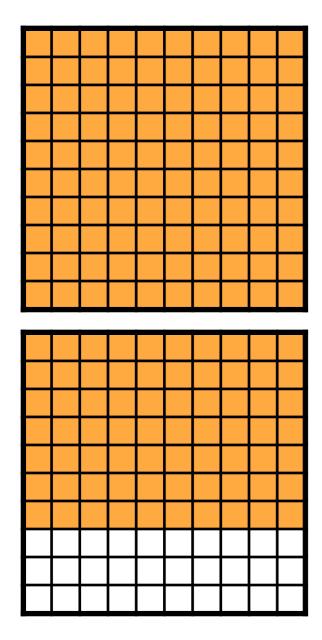


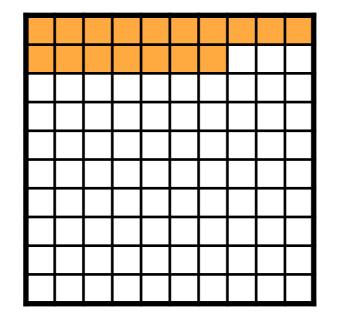


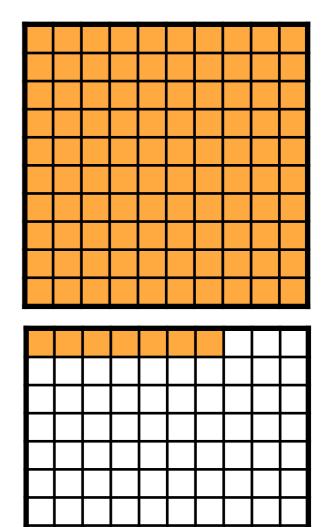


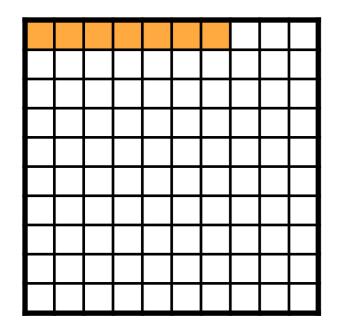


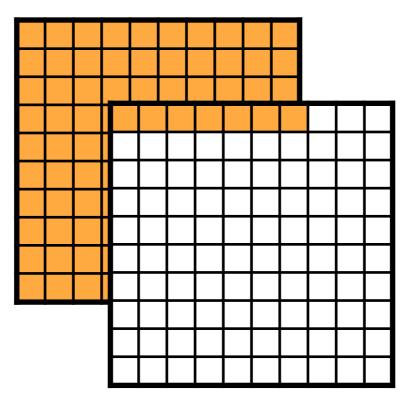


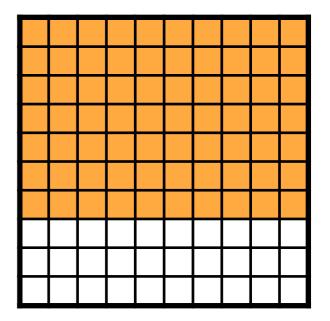


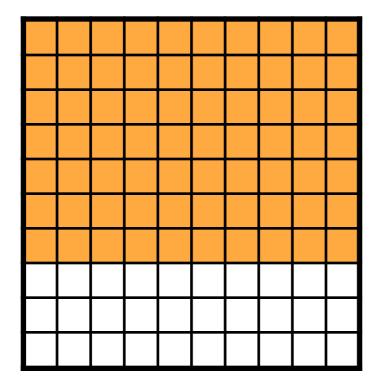


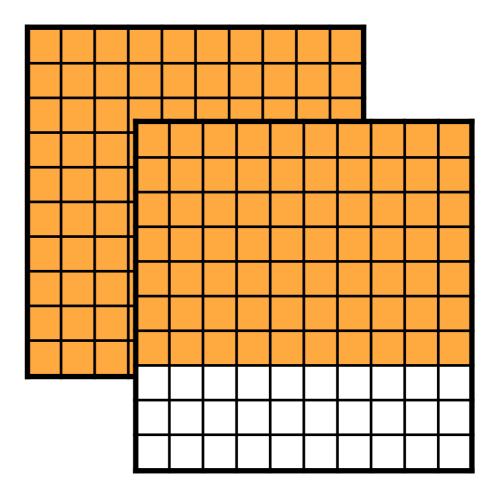


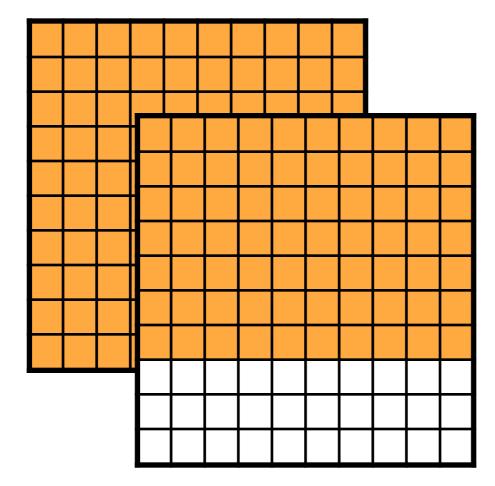


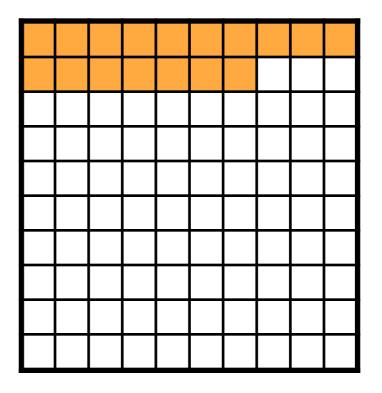


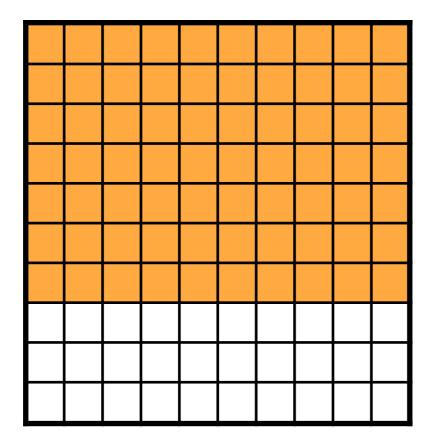


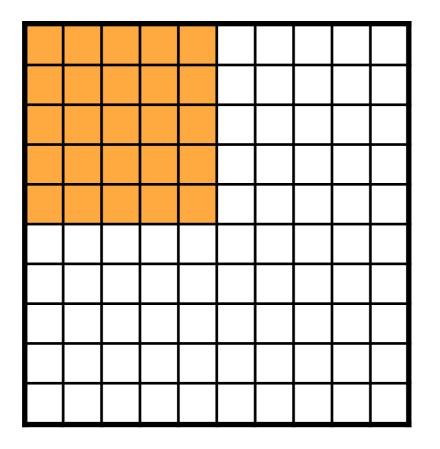


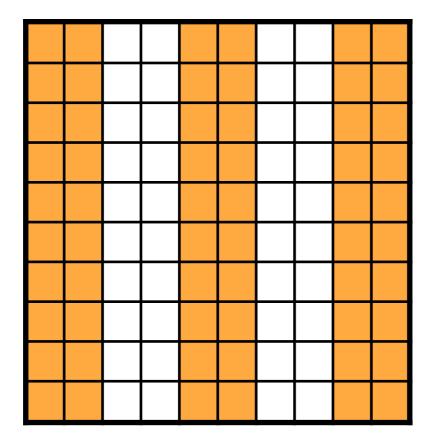


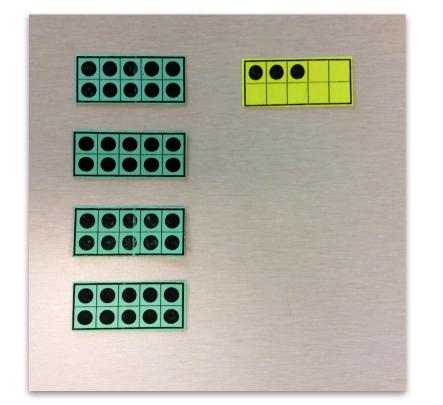


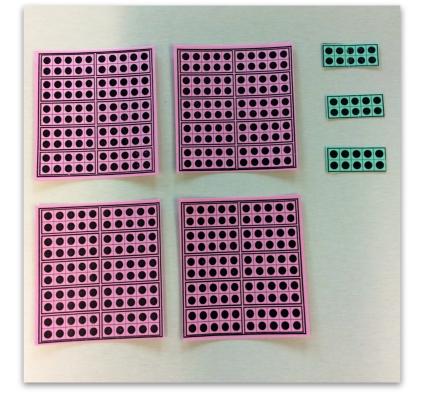


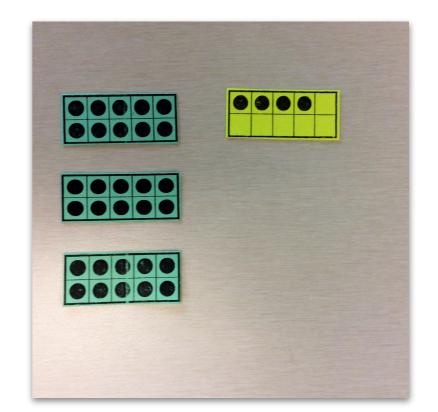


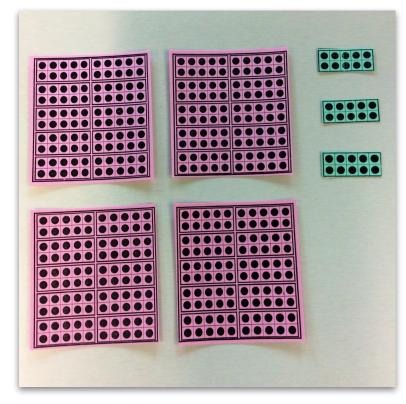


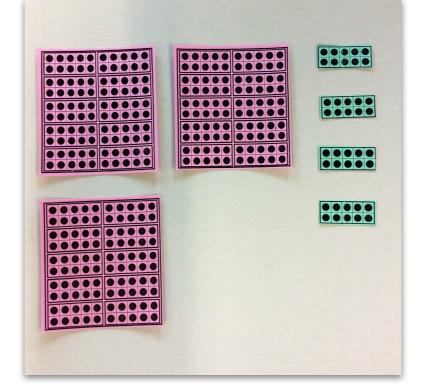


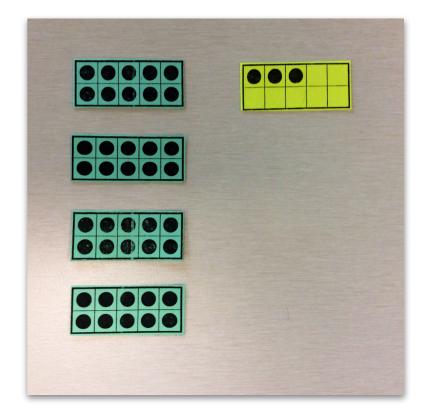


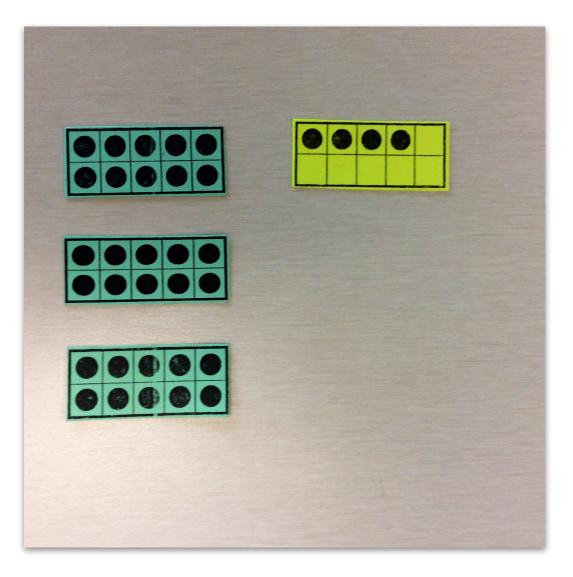


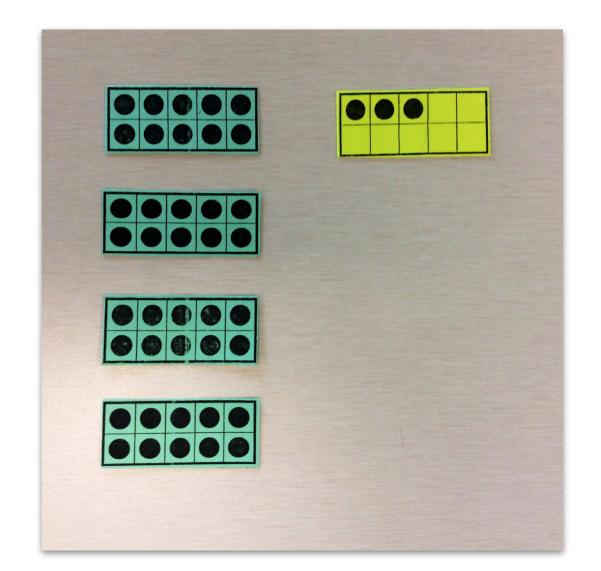


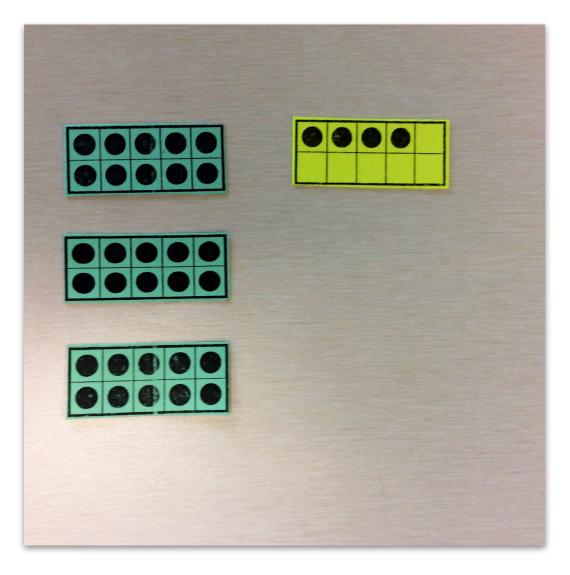












## $60 \div 3$

 $6\div 0.3$ 

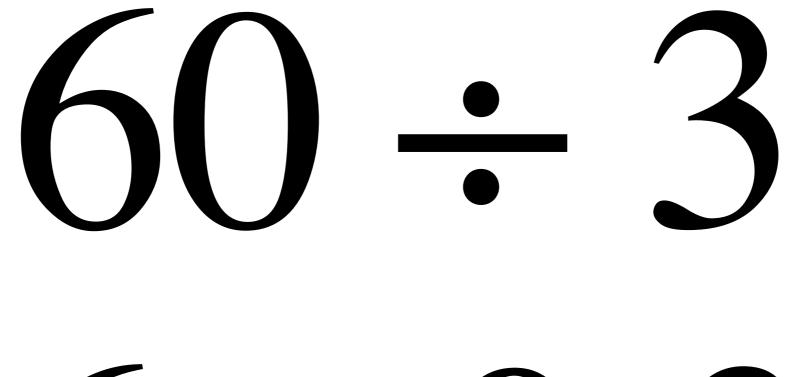
 $0.6 \div 3$ 

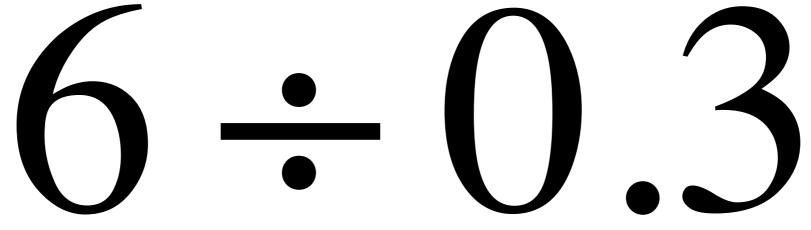
# $\frac{6}{5} \div 3 \quad 600 \div 300 \quad \frac{6}{5} \div \frac{3}{5}$

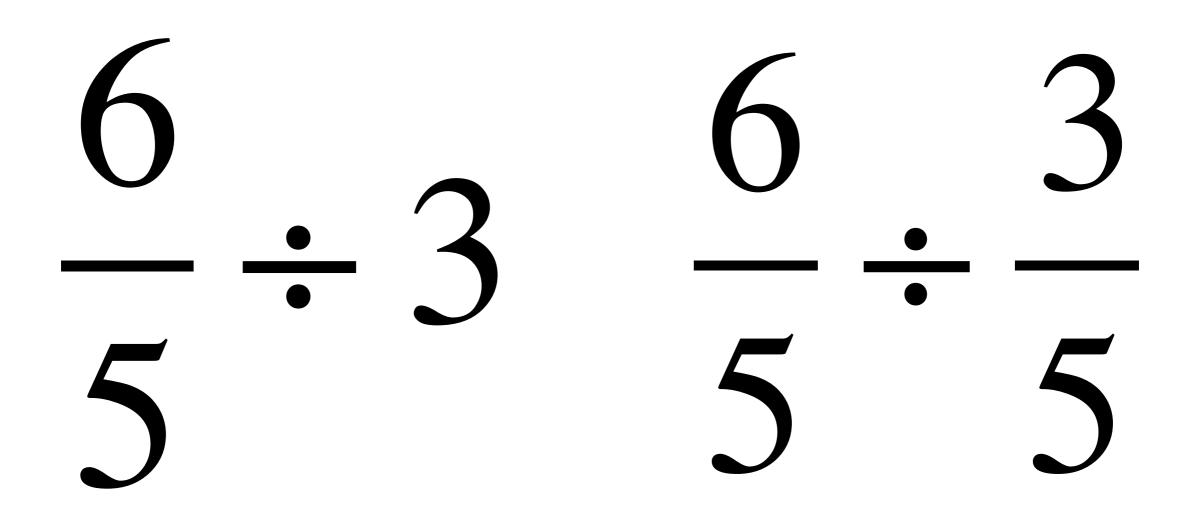
 $(-6) \div (-3)$ 

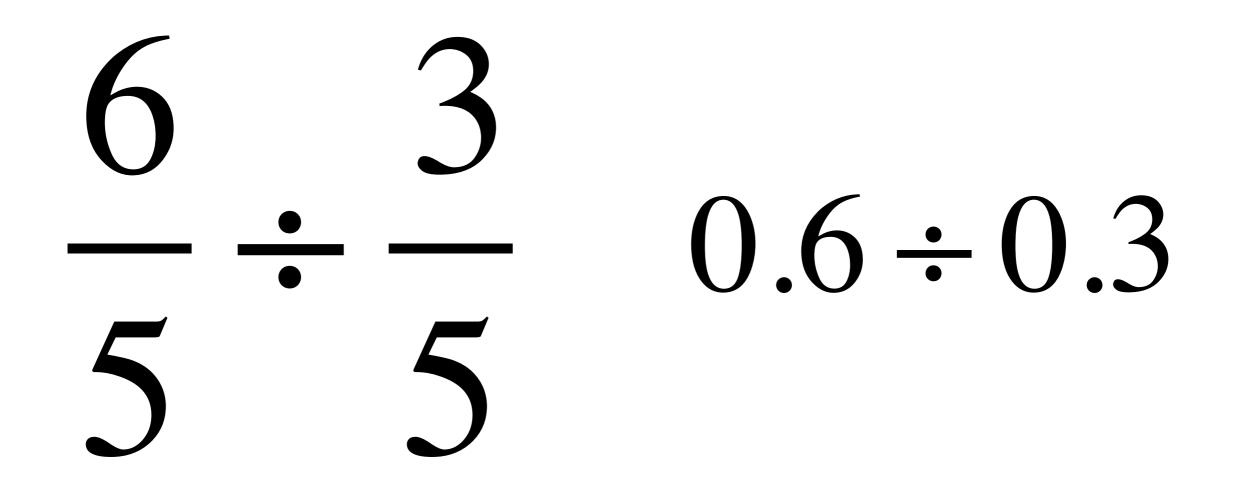
 $6x \div 3x$ 

 $(-6) \div (+3)$ 









## $(-6) \div (-3)$

## $6x \div 3x$

# $6x \div 3x$

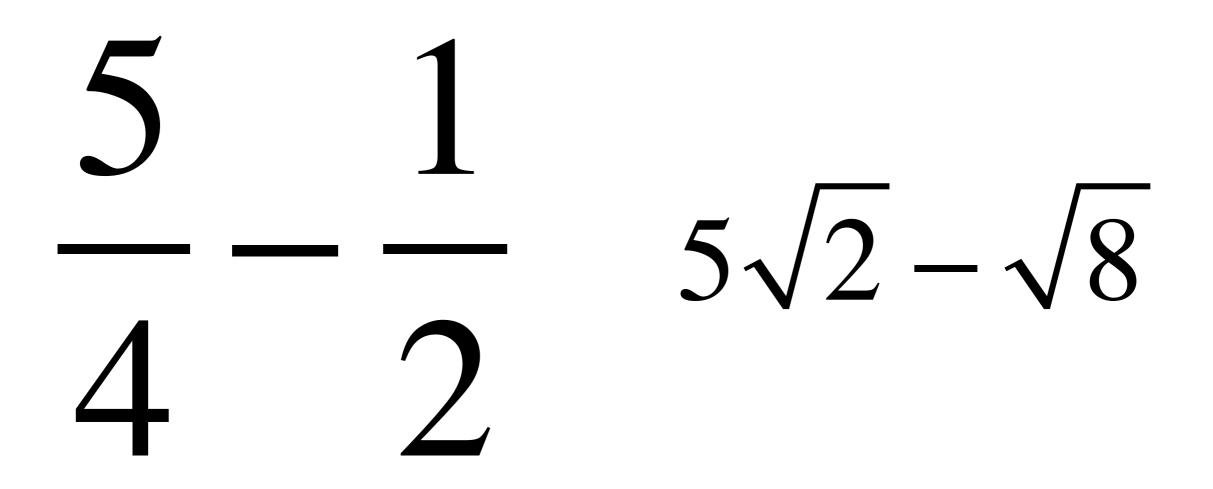
# $600 \div 3$

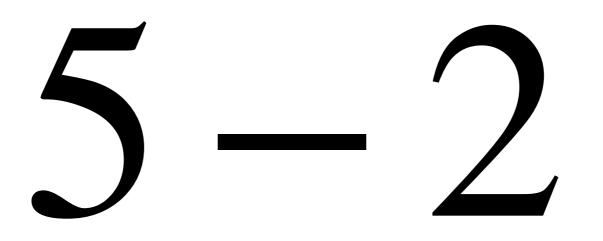
### 500 - 200

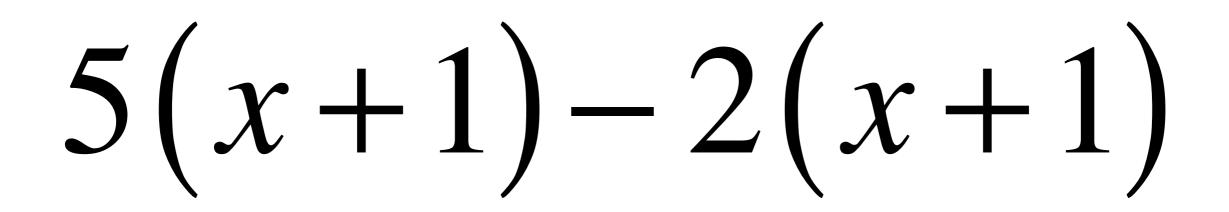
# 0.5 - 0.2

### 0.5 - 0.2

5 1 2

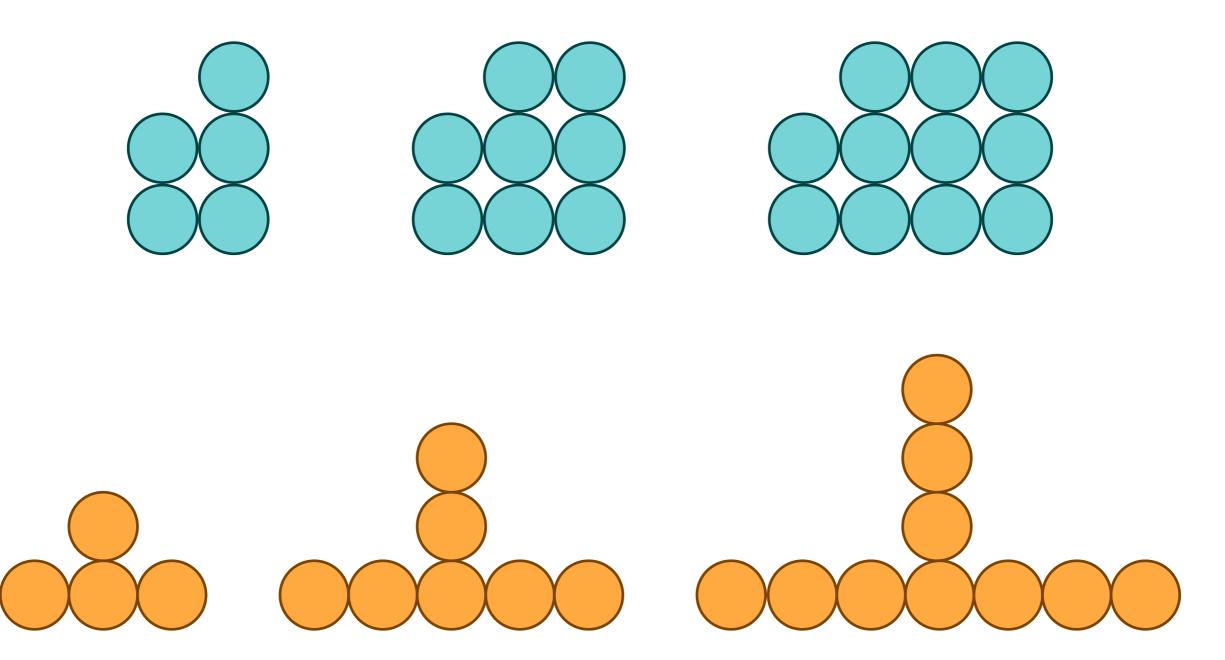


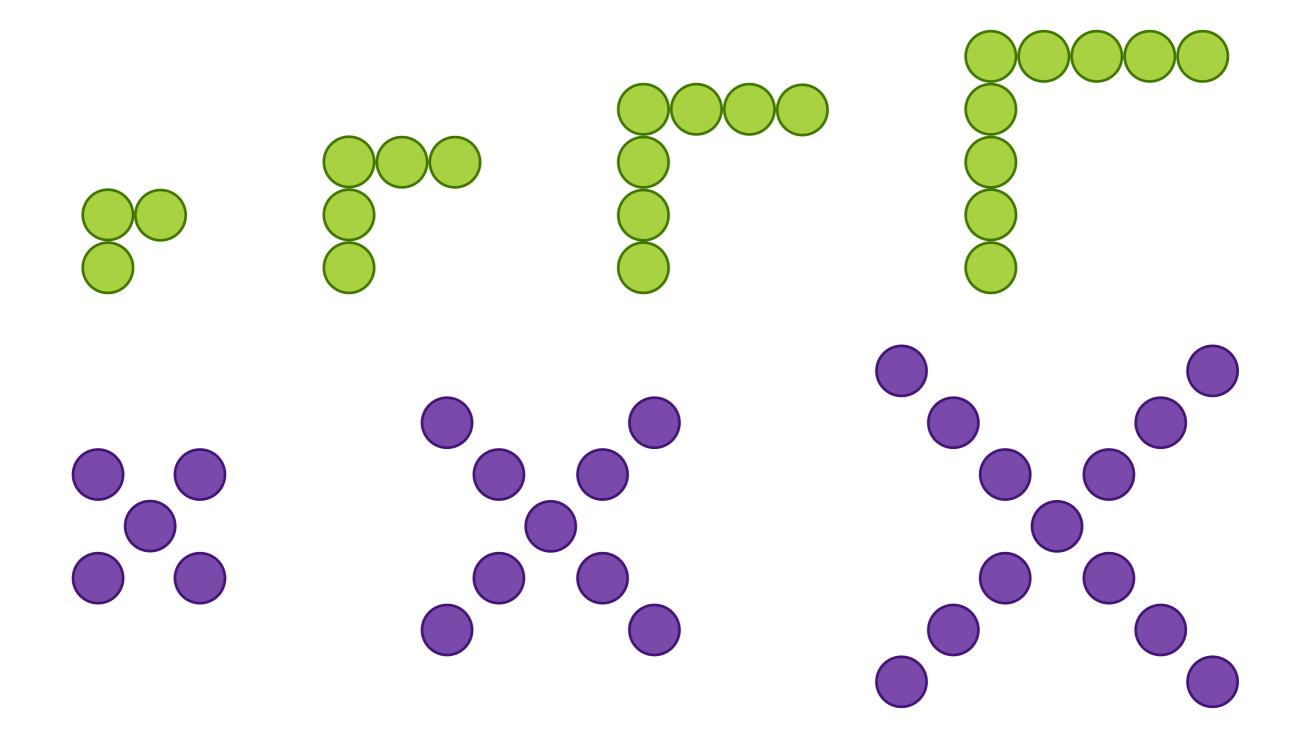


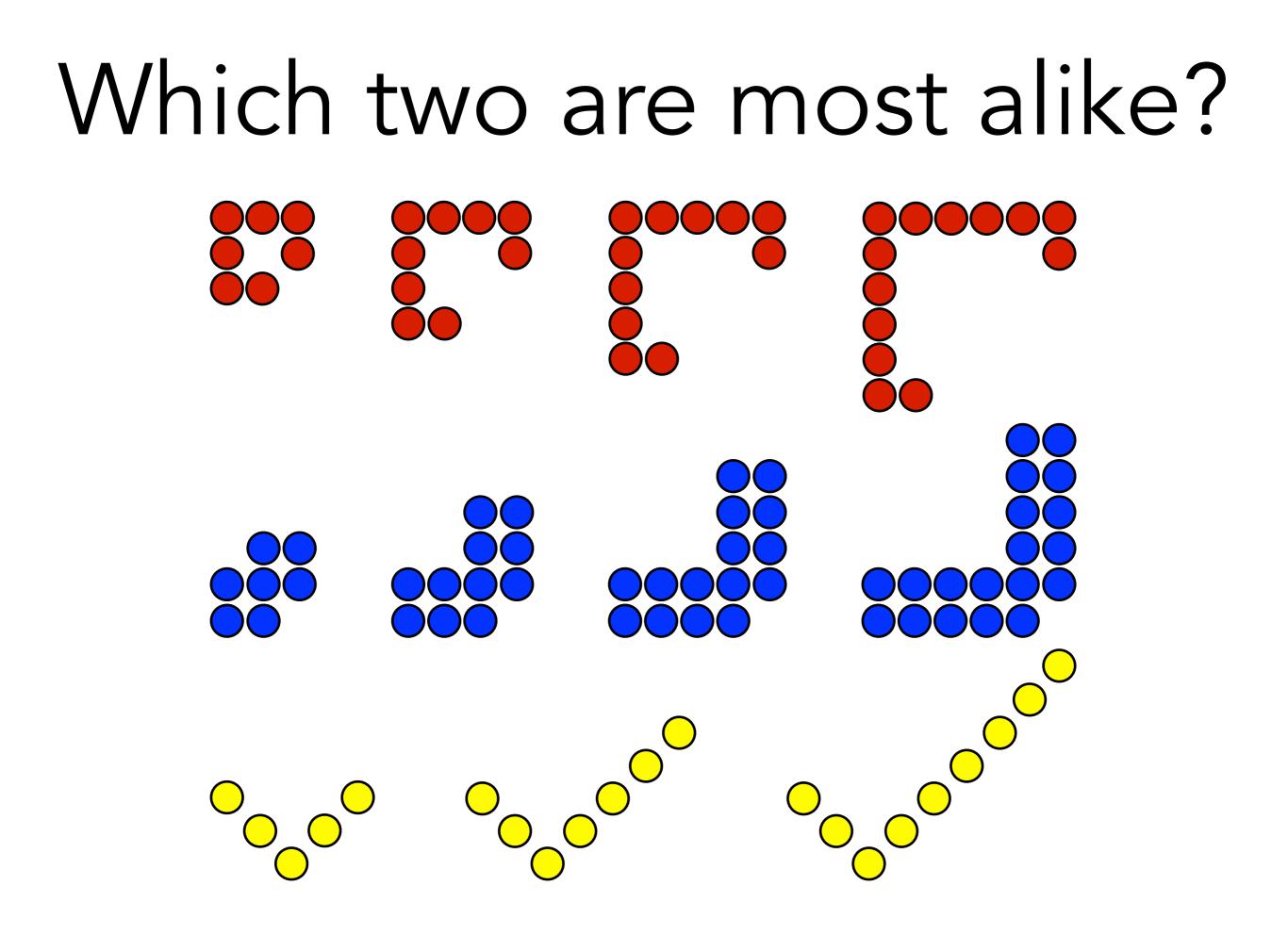


### **5005** – 2002

5(x+1)-2(x+1)

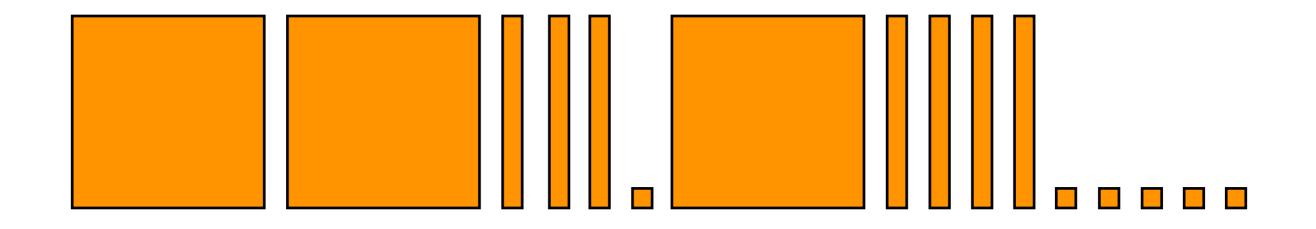


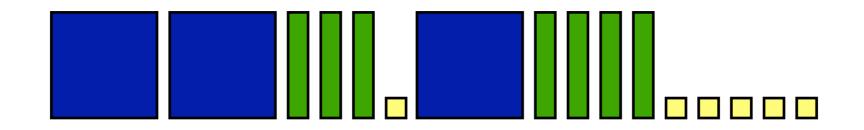




 $(2x^2 + 3x + 1) + (x^2 + 4x + 5)$ 

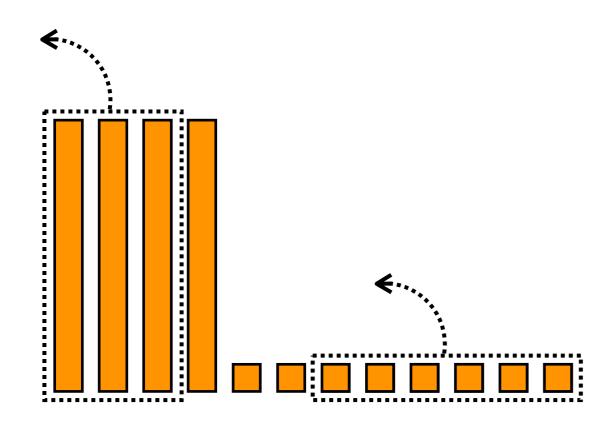
### 231 + 145

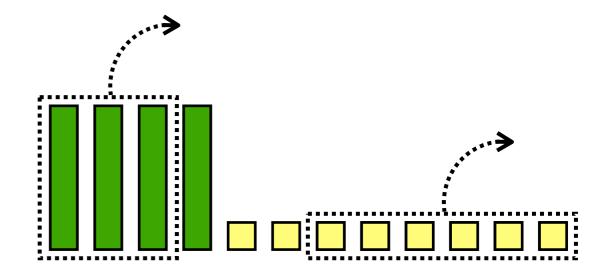


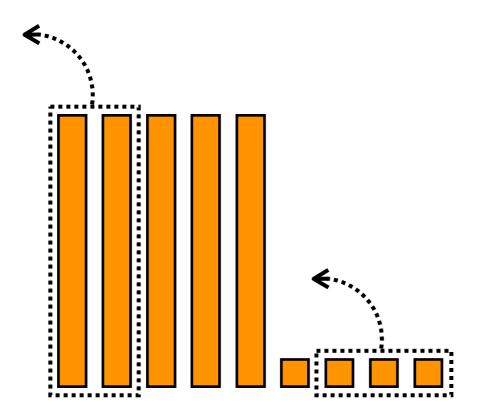


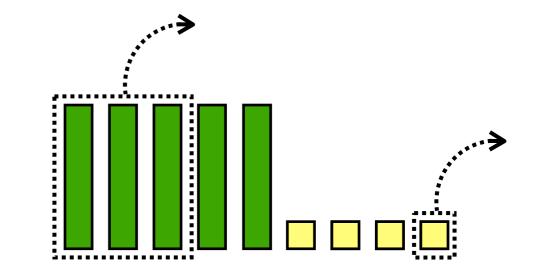
## $\left(4x+8\right) - \left(3x+6\right)$

## 48 - 36



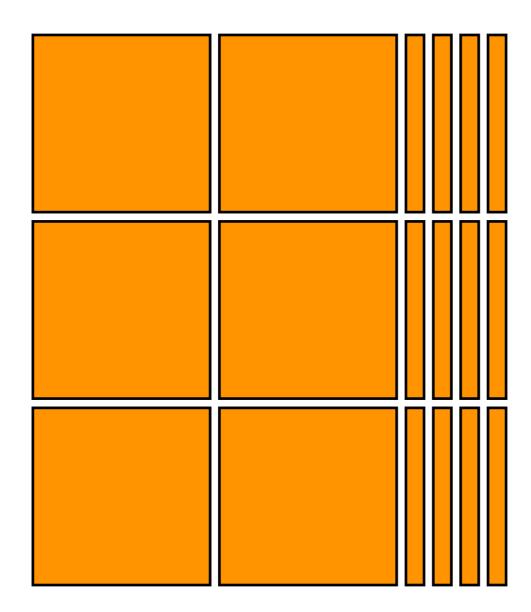


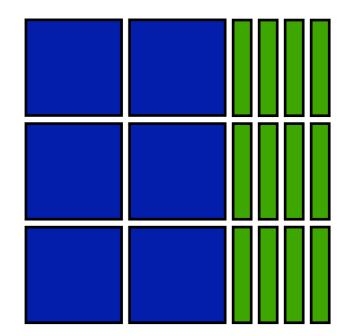


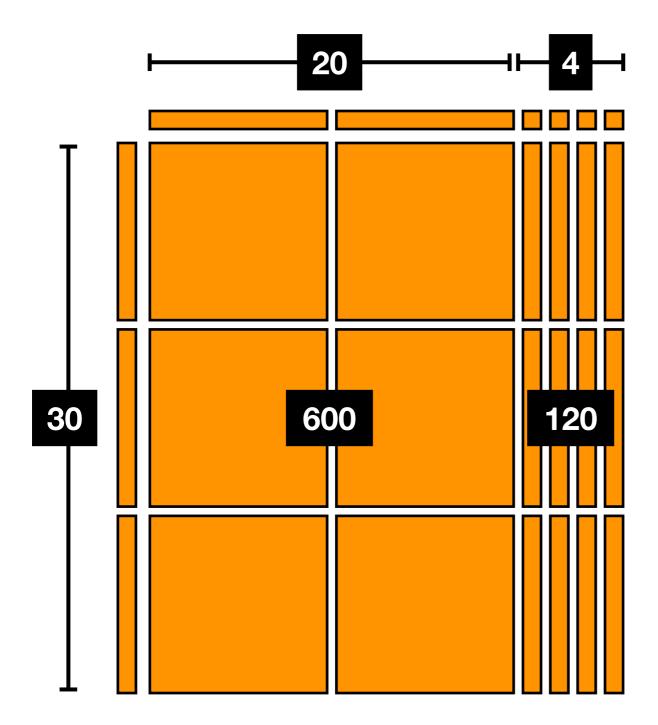


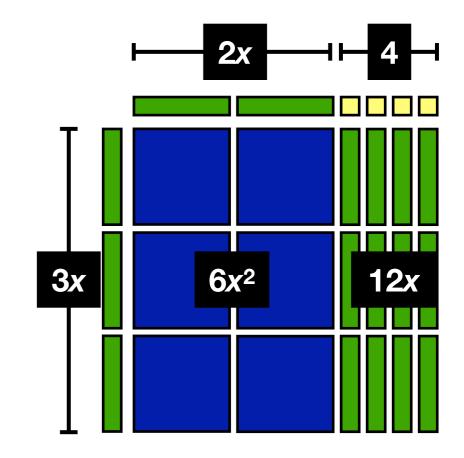
3x(2x+4)

30) X 24

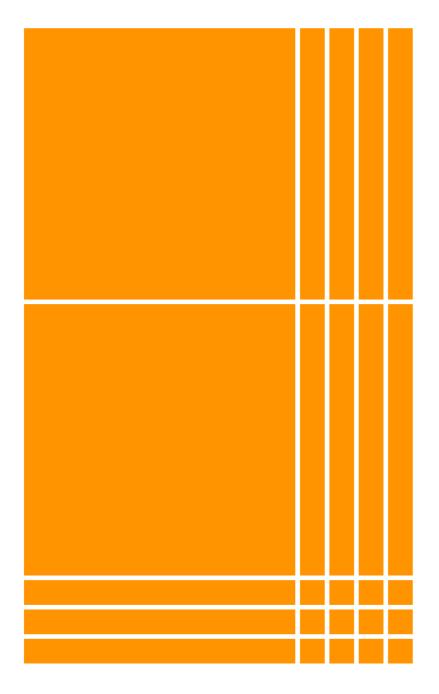


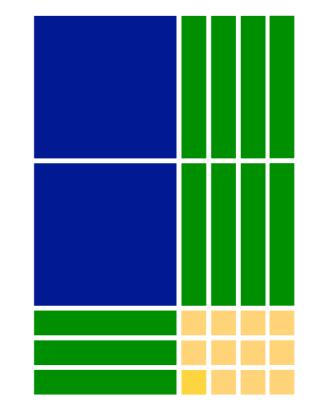


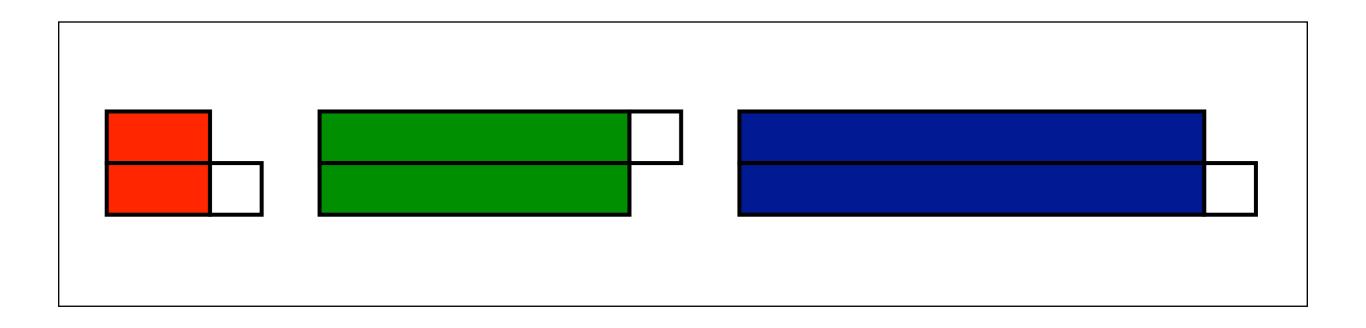


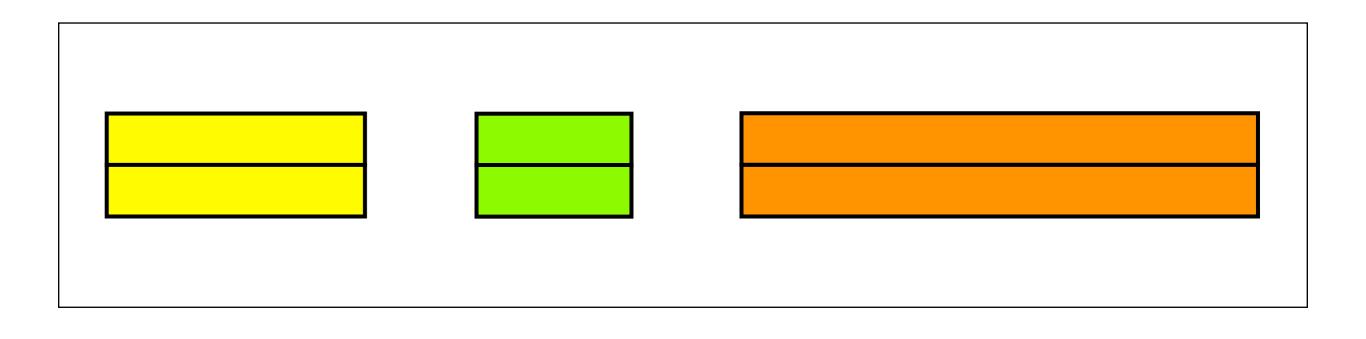


23X(2x+3)(x+4)

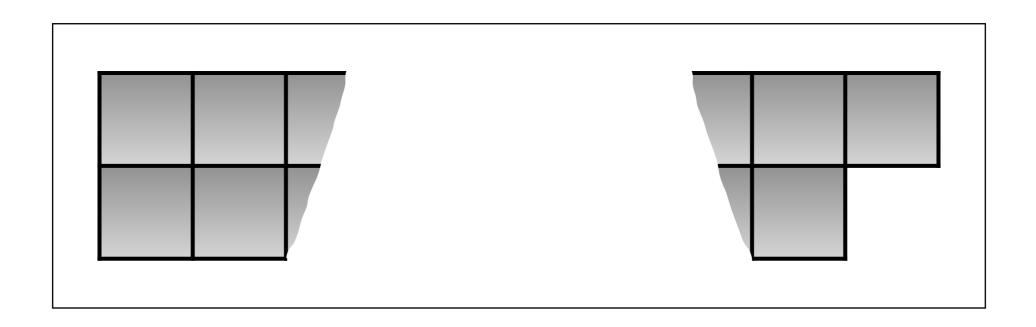


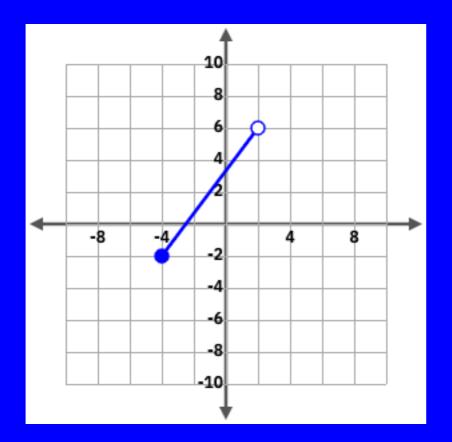


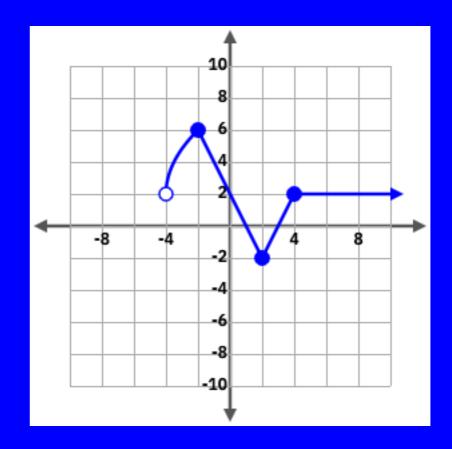


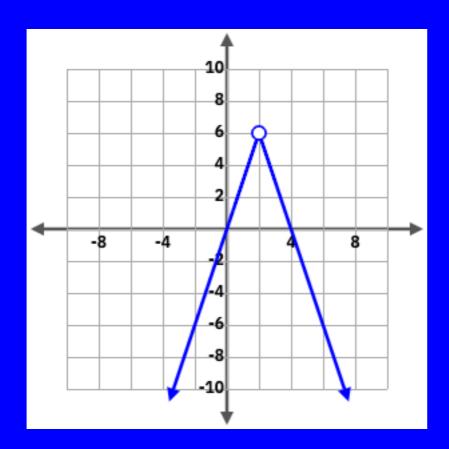


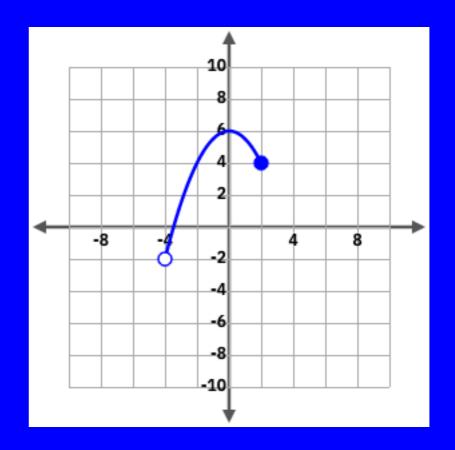






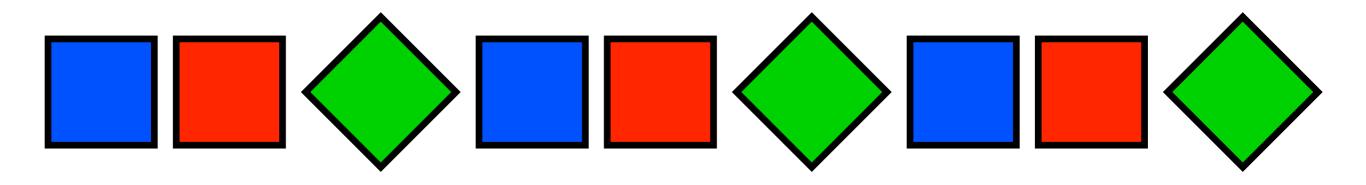




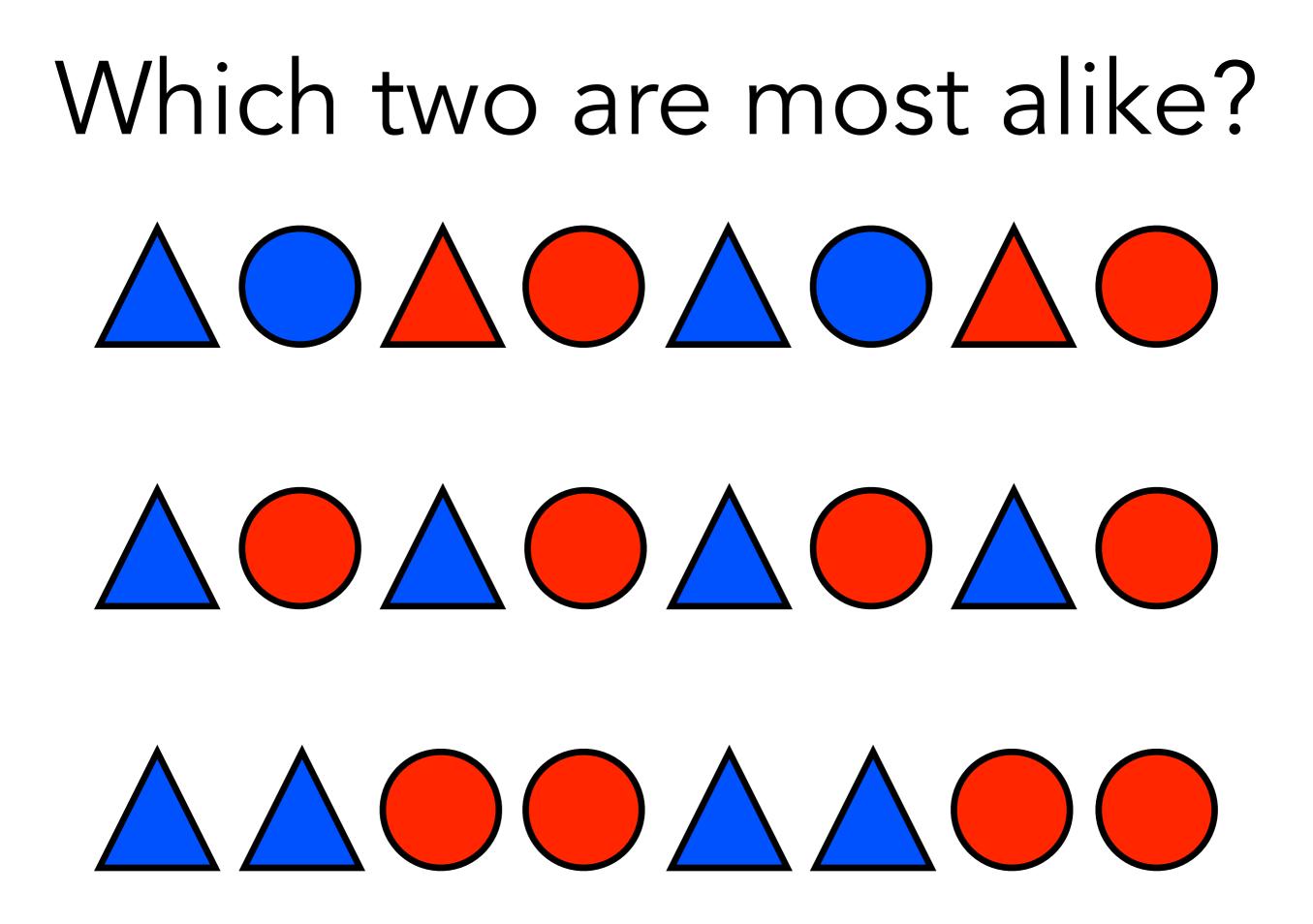


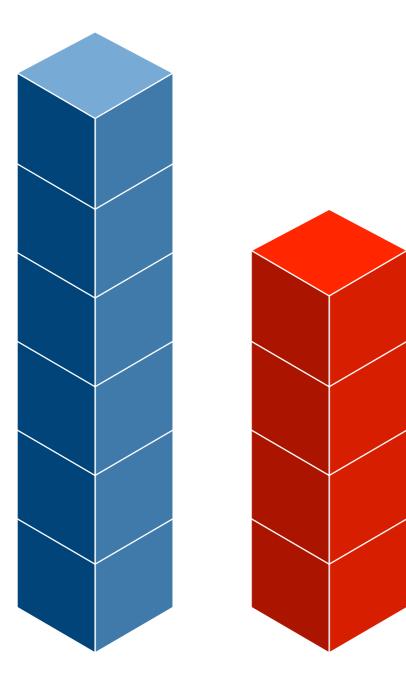
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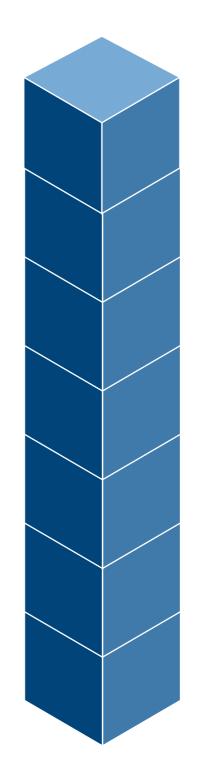
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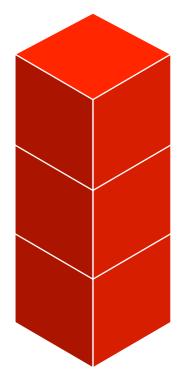


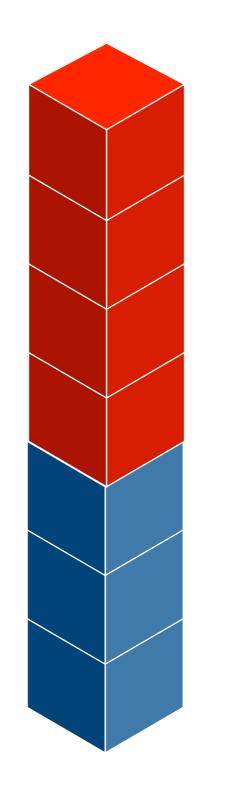
### 

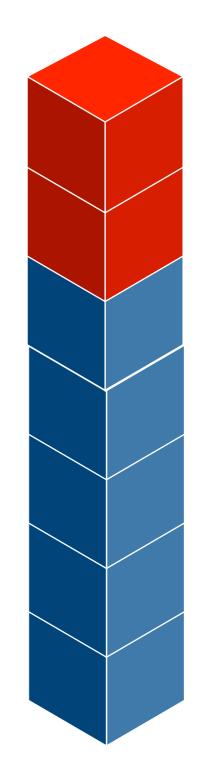












 $x^2 + 5x + 6$   $x^2 + 5x - 6$  $x^2 - 5x + 6$   $x^2 - 5x - 6$ 

$$x^{2} + 10x + 24 \qquad x^{2} + 10x - 24$$
$$x^{2} - 10x + 24 \qquad x^{2} - 10x - 24$$















### Which two are most alike?

## 20, 14, 8, 2, ... 3, 7, 11, 15, ... 4, 8, 16, 32, ...

$$\frac{1}{(x-1)(x+1)} \qquad \frac{1}{x^2+1}$$
$$\frac{1}{(x-1)^2} \qquad -\frac{1}{x^2-1}$$

$$y = \frac{1}{(x-1)(x+1)} \qquad y = \frac{1}{x^2+1}$$
$$y = \frac{1}{x^2+1}$$
$$y = -\frac{1}{x^2-1}$$

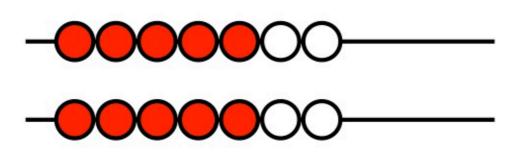
$$y = 2(x - 1)^{2} + 3$$
$$y = \frac{1}{2}(x - 3)^{2} - 5$$
$$y = 3(x + 2)^{2} - 4$$
$$y = -\frac{3}{2}(x - 4)^{2} + 6$$

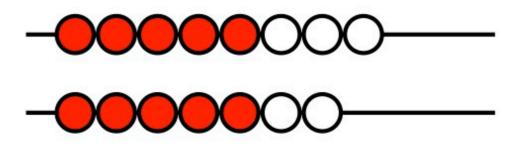
$$f(x) = 2(x-1)^{2} + 3$$

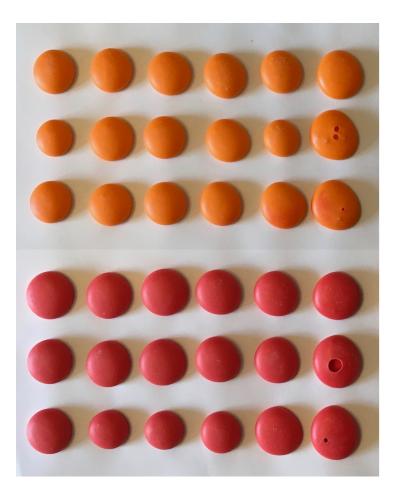
$$f(x) = \frac{1}{2}(x-3)^{2} - 5$$

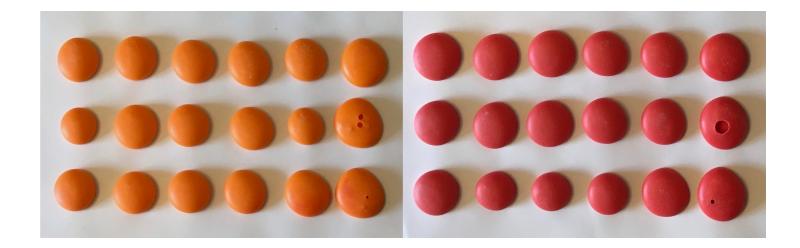
$$f(x) = 3(x+2)^{2} - 4$$

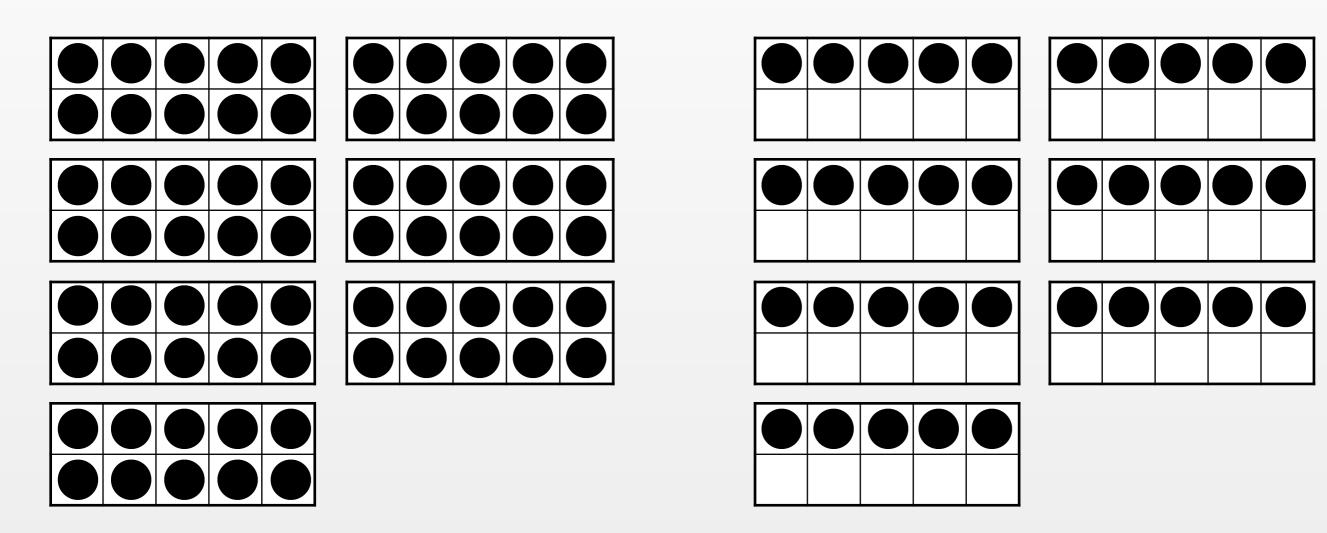
$$f(x) = -\frac{3}{2}(x-4)^{2} + 6$$

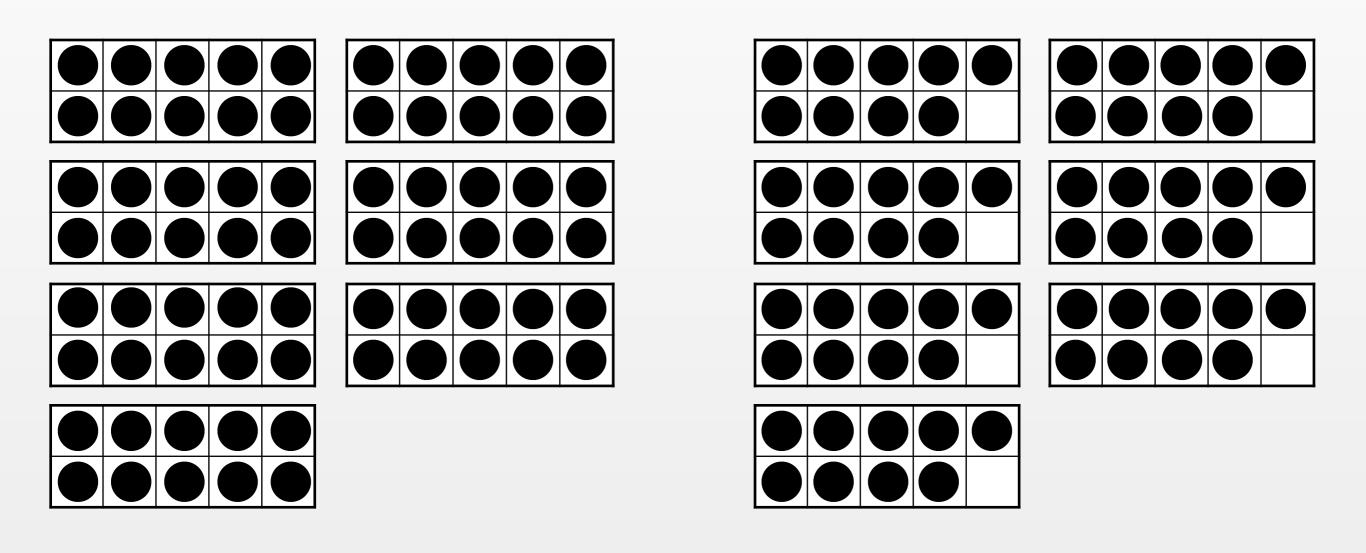


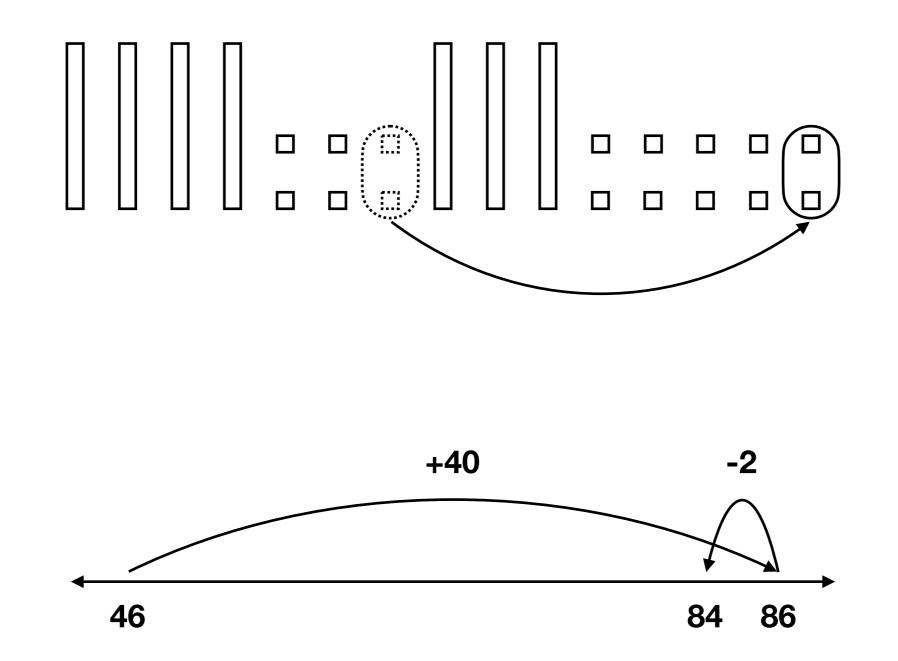


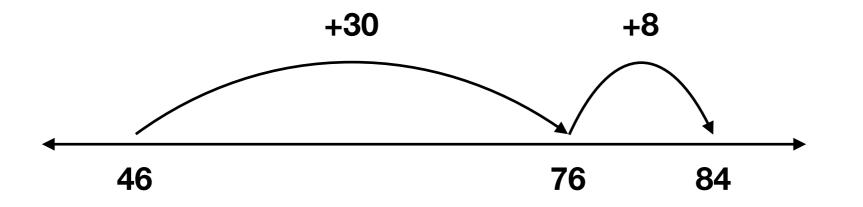


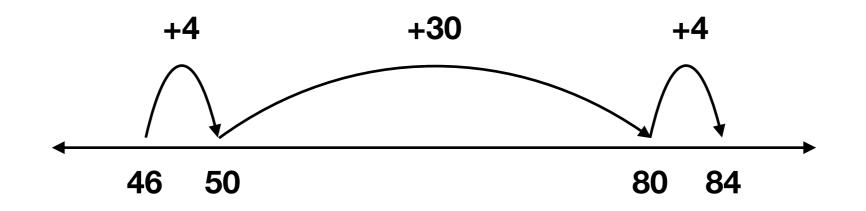


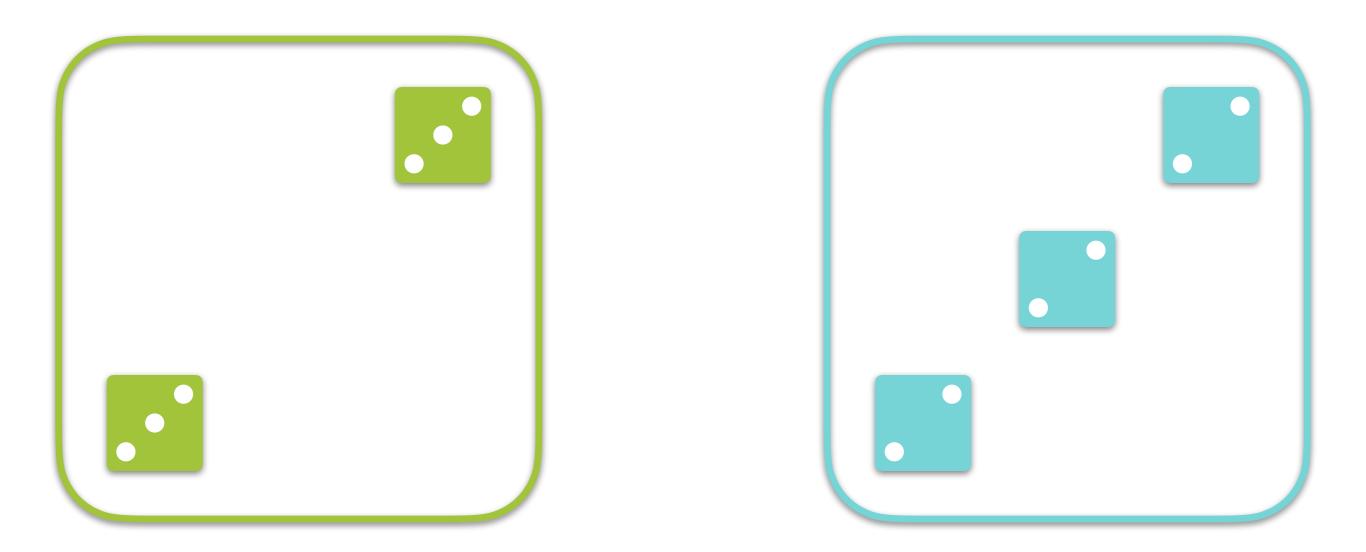


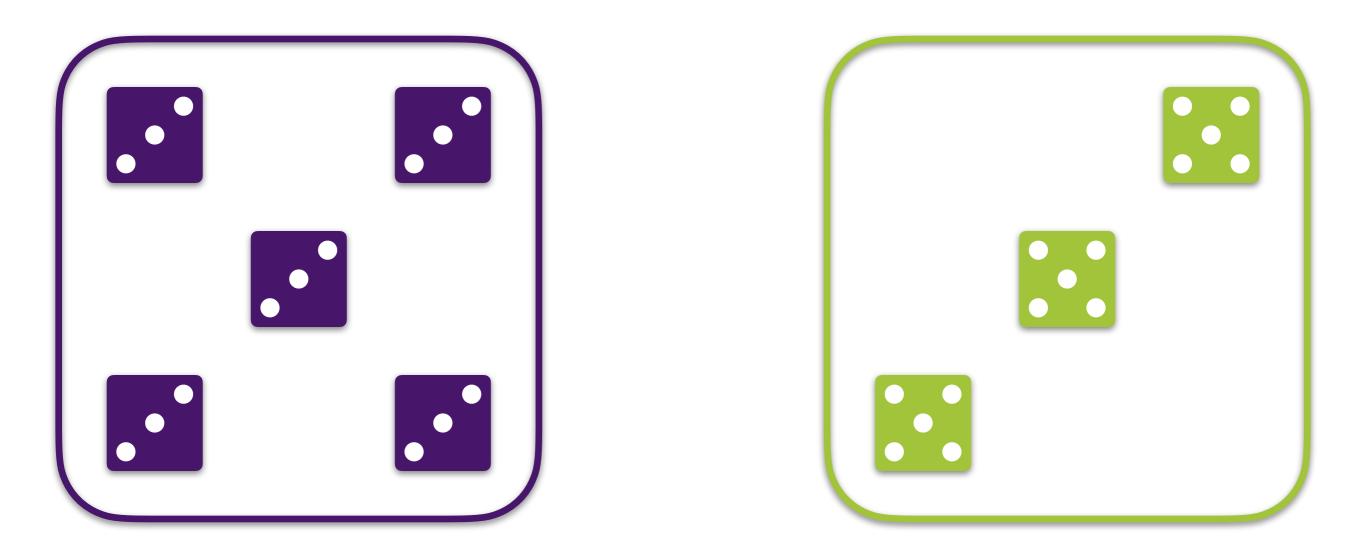


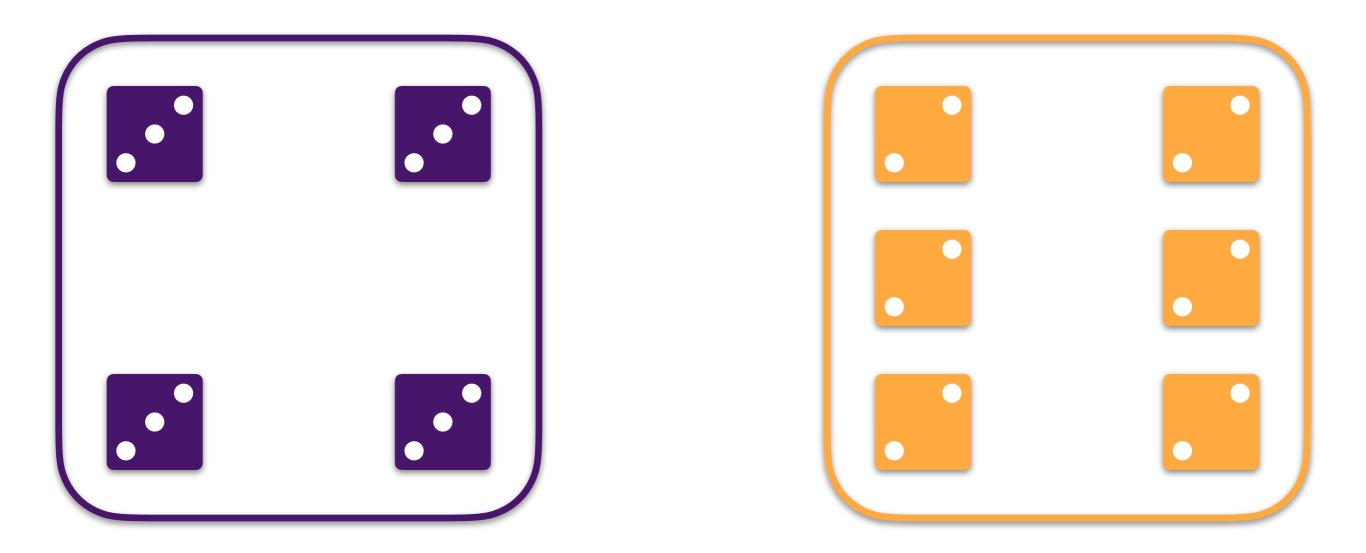


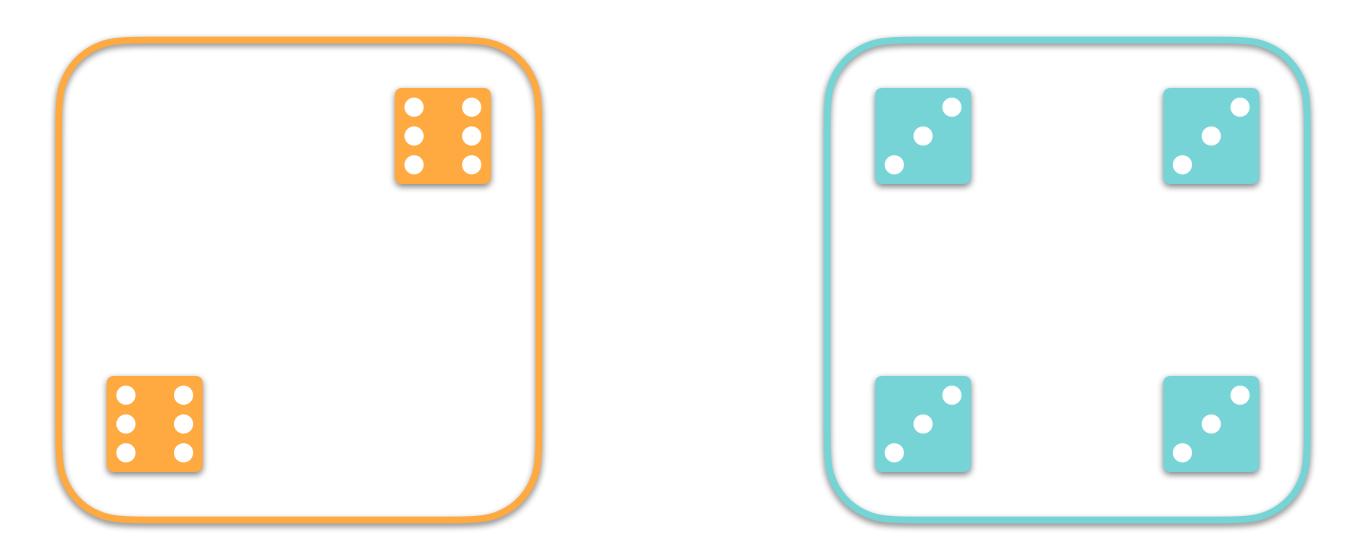




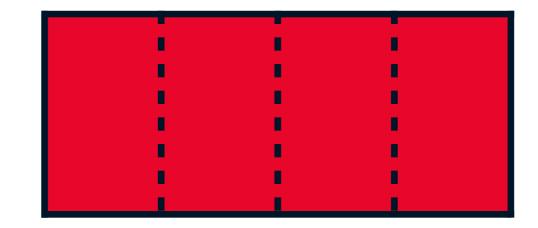


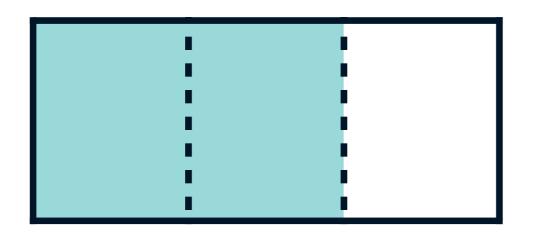


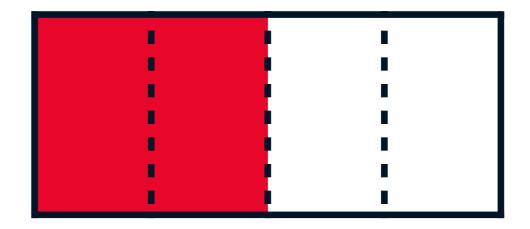




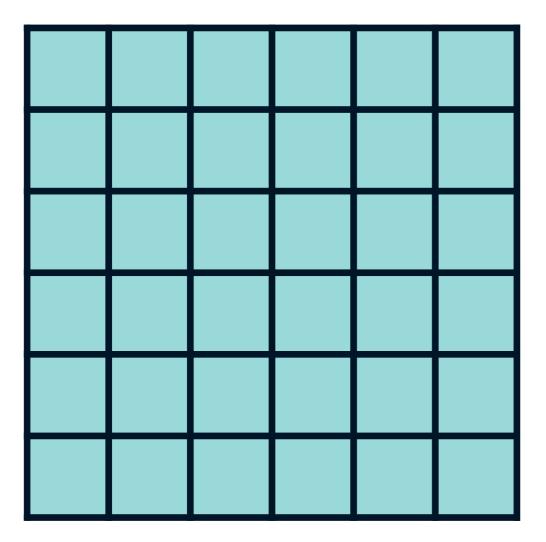


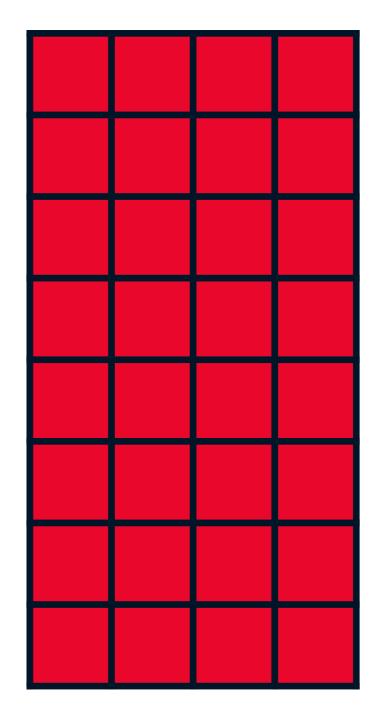


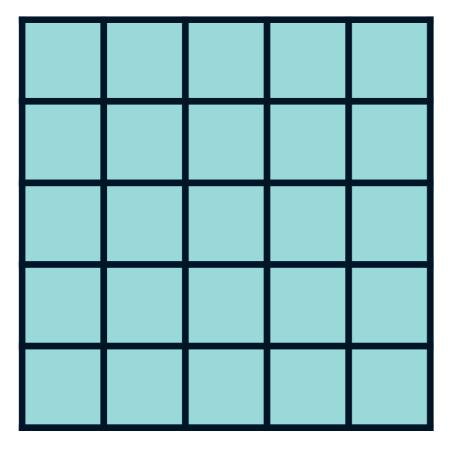


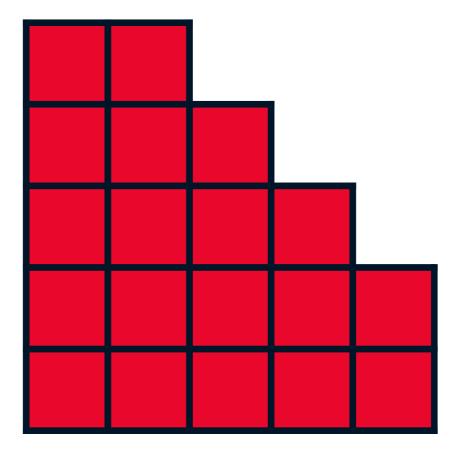


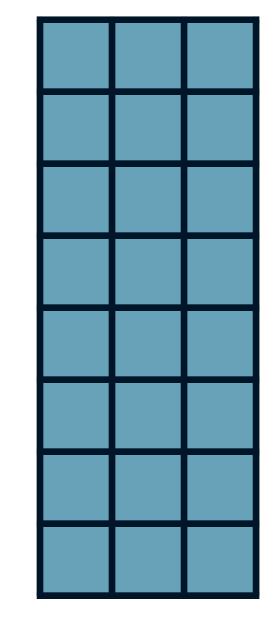


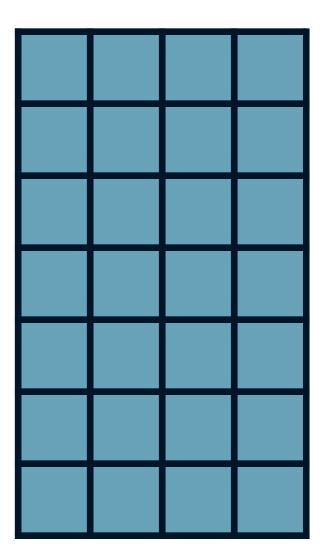


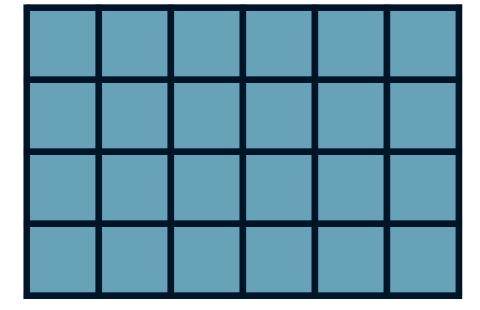




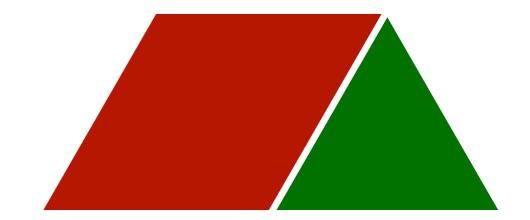


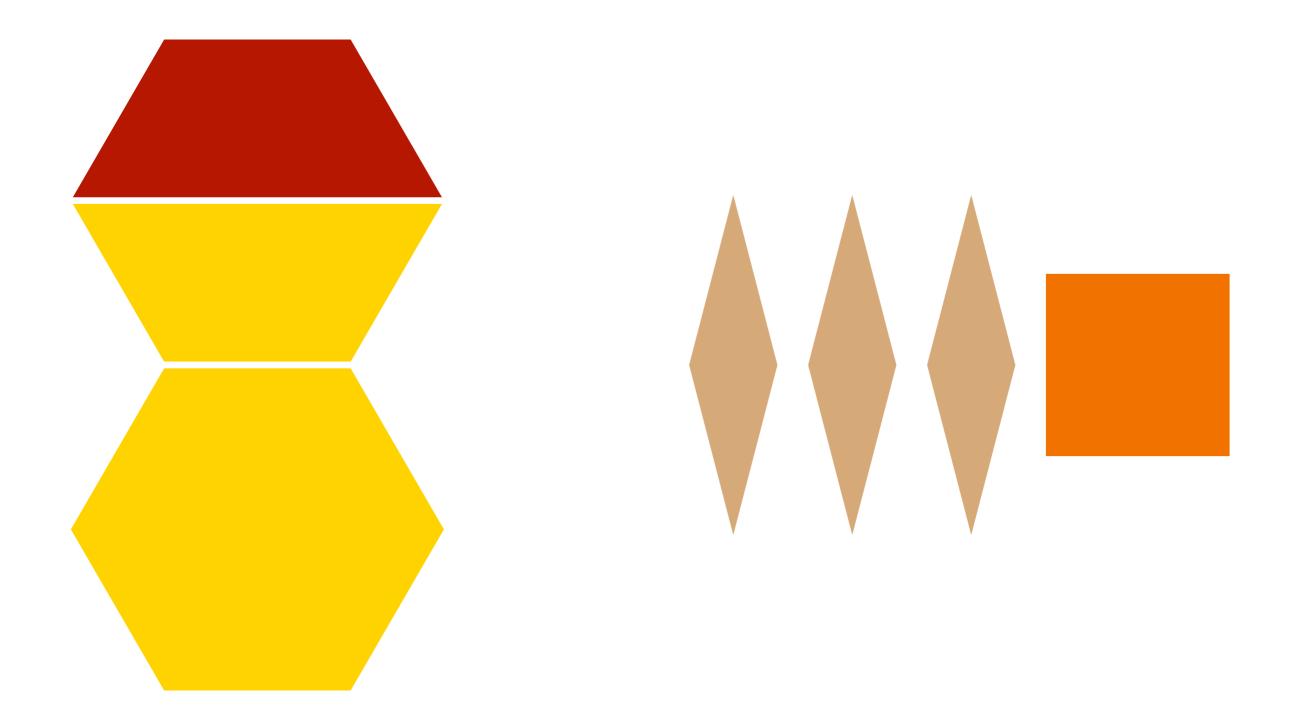


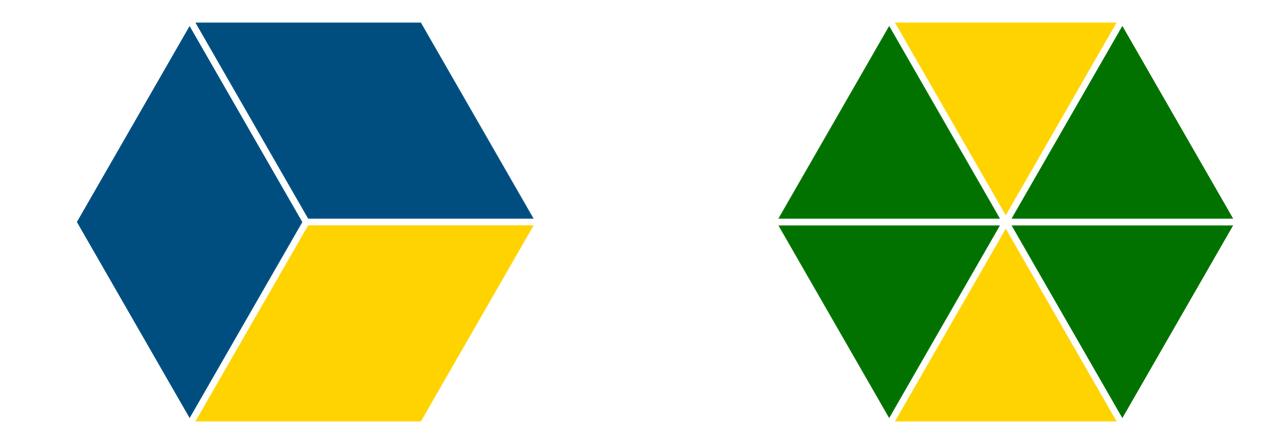


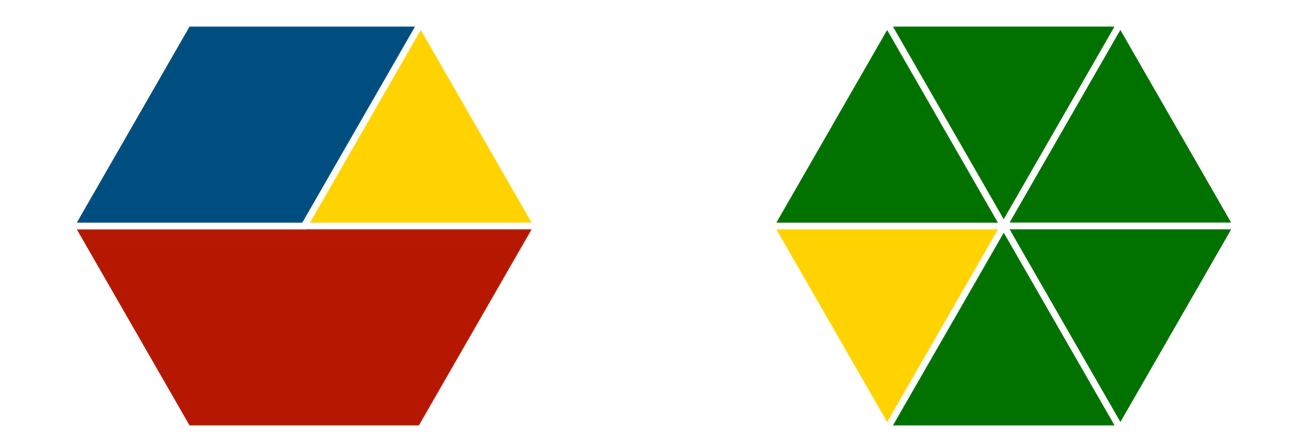


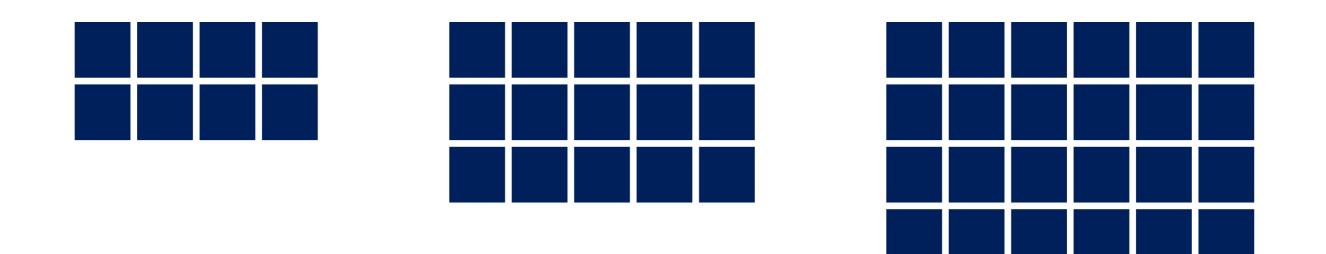


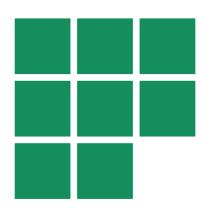


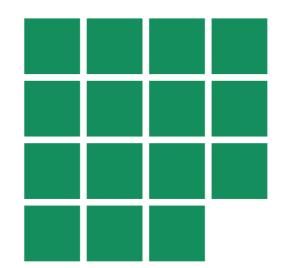


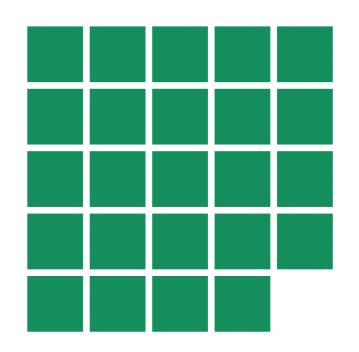


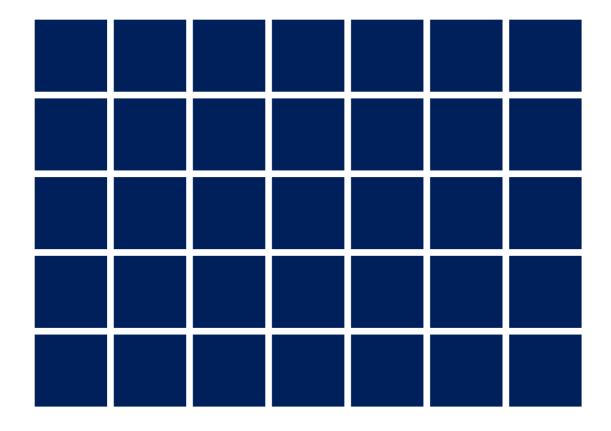


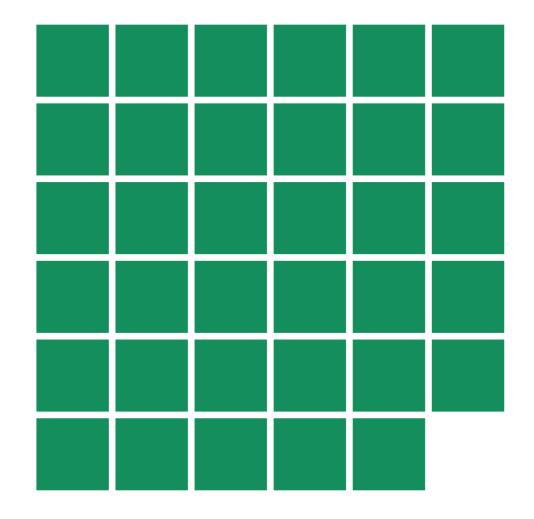


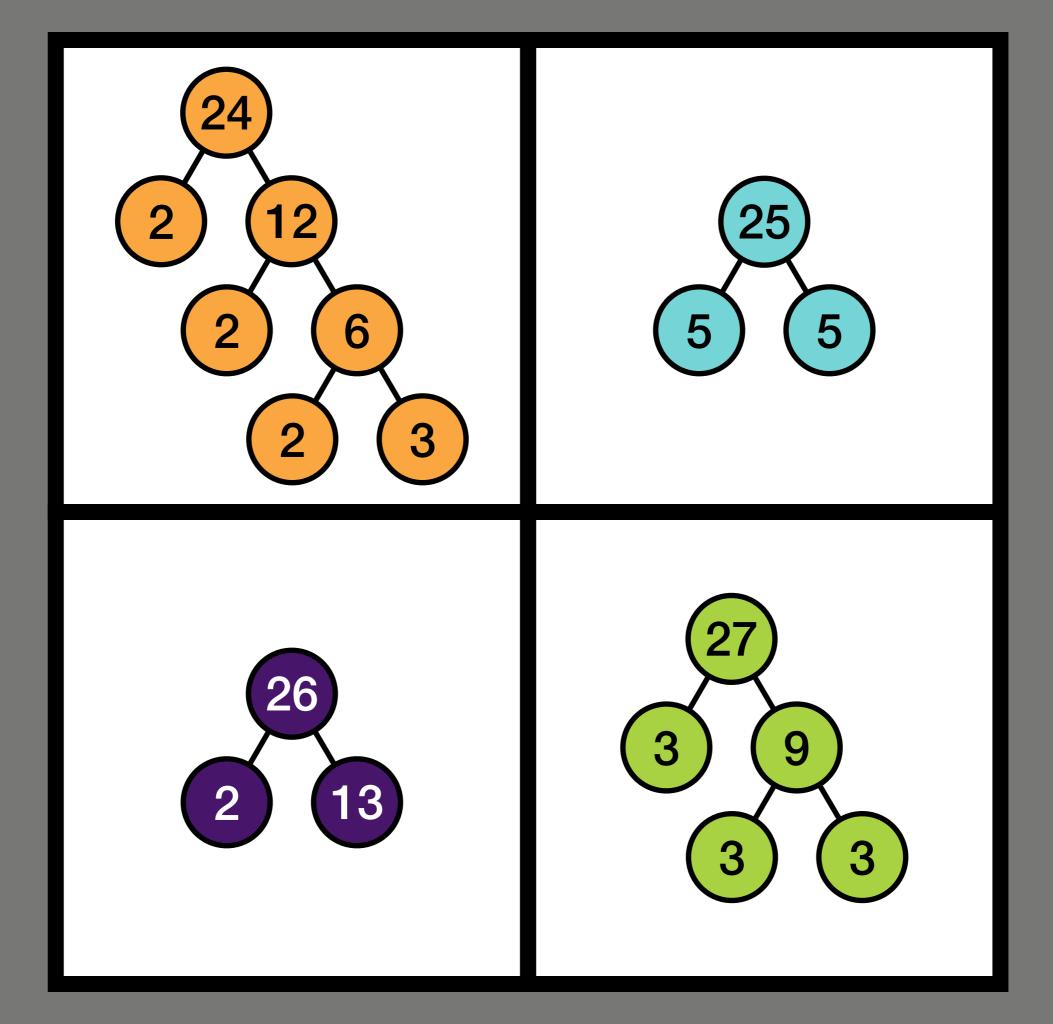


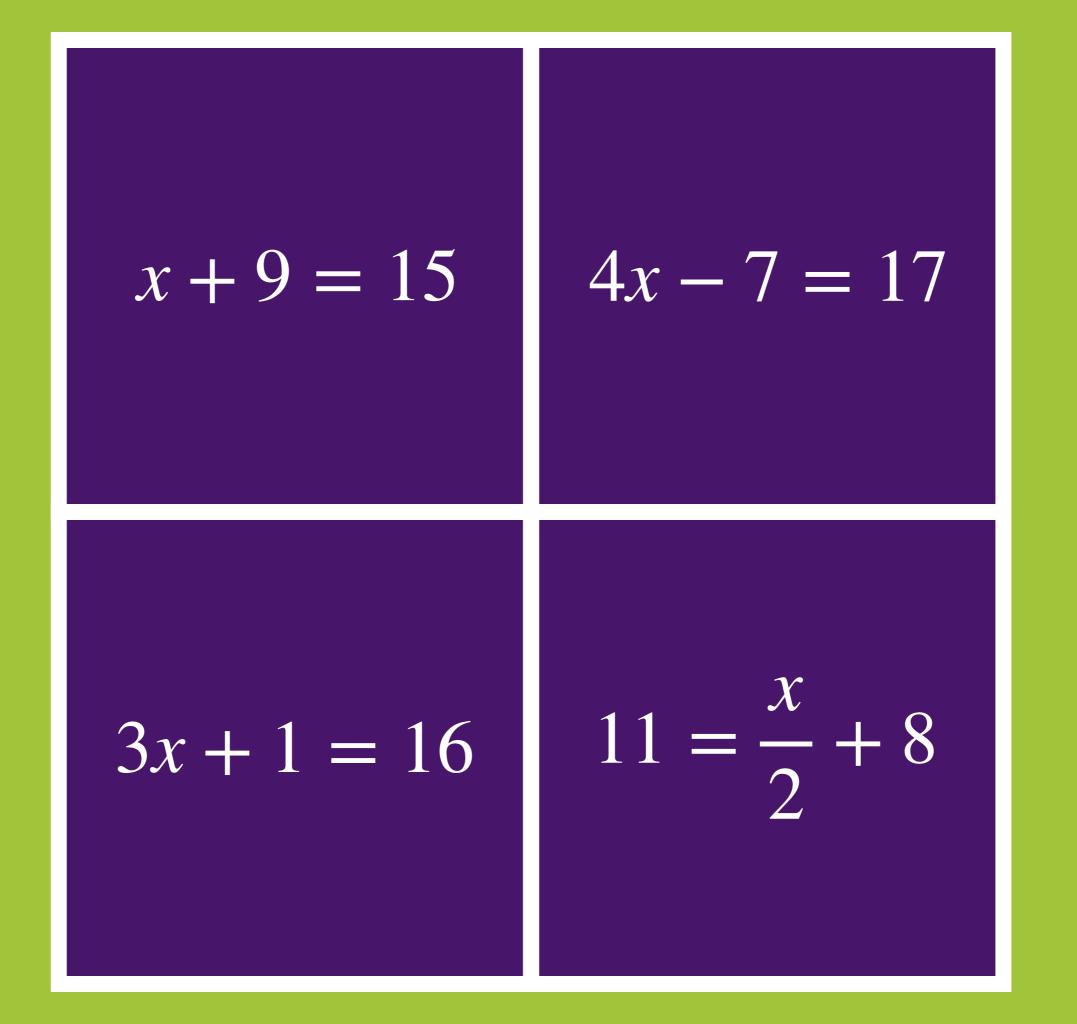


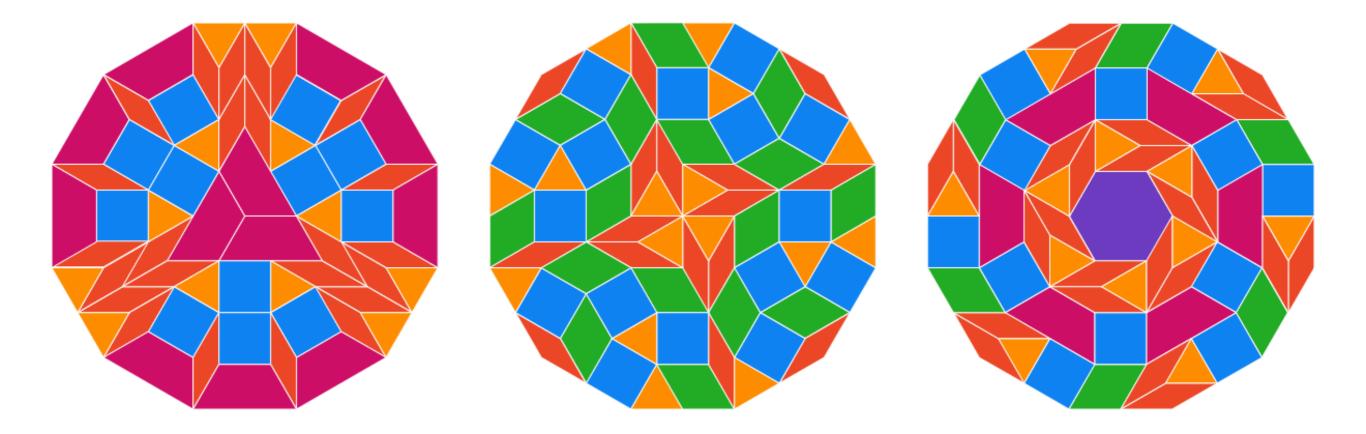




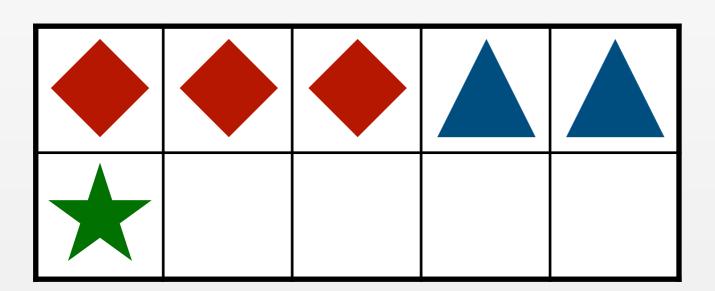


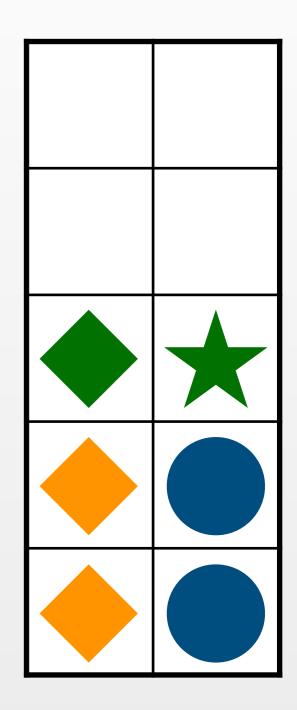




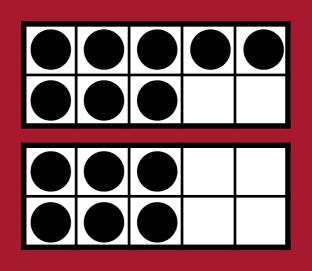


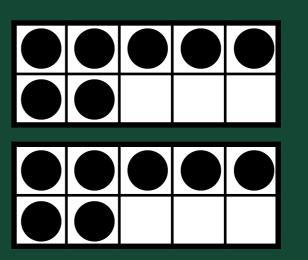
Polypad by Mathigon

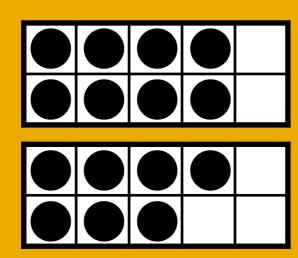


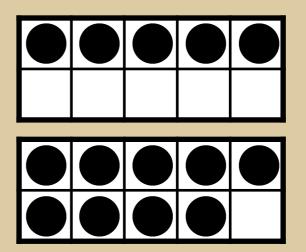


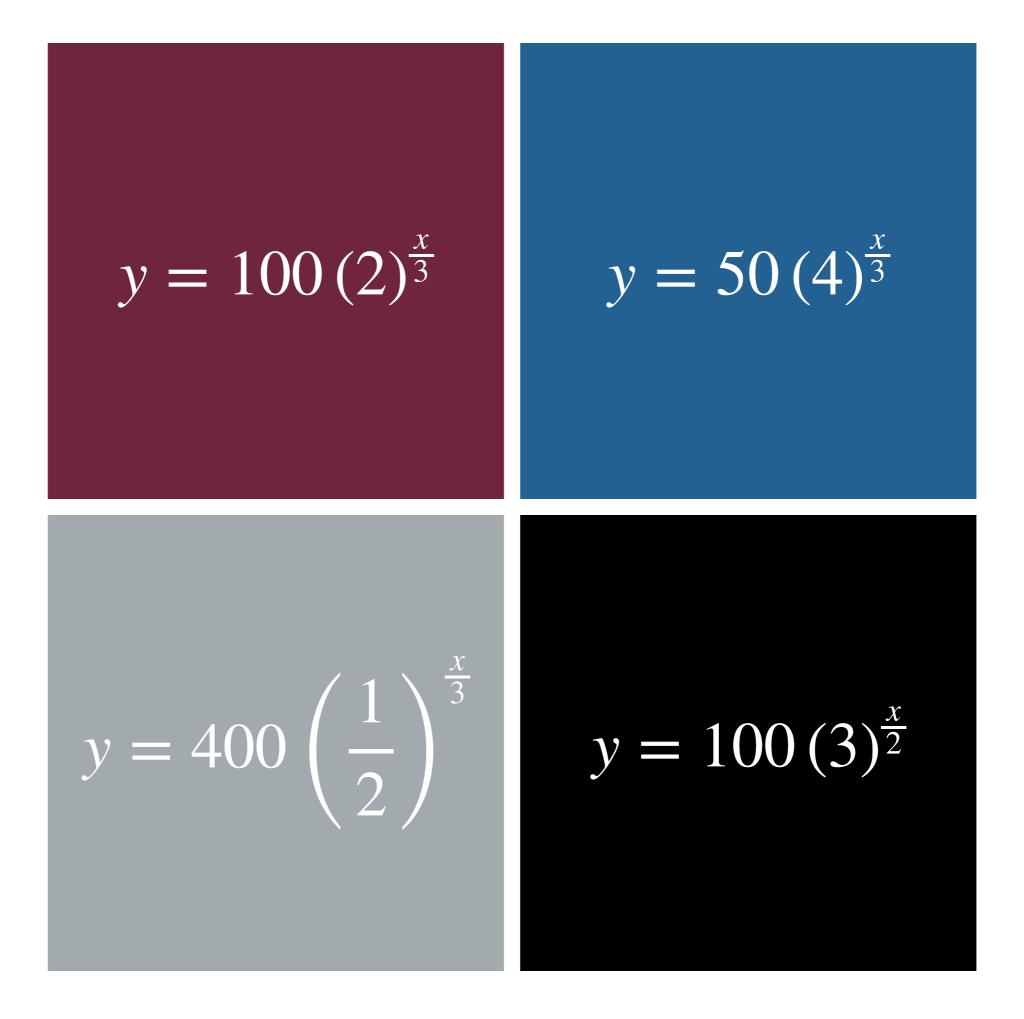
# x + 4 = 63(x + 4) = 183x + 12 = 18





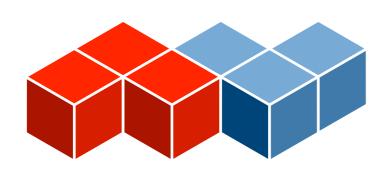


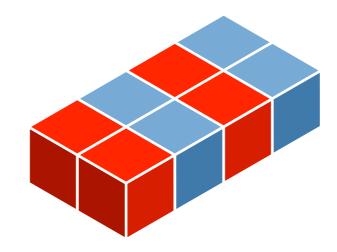


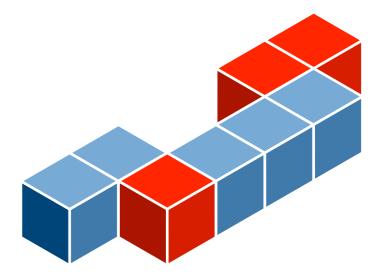


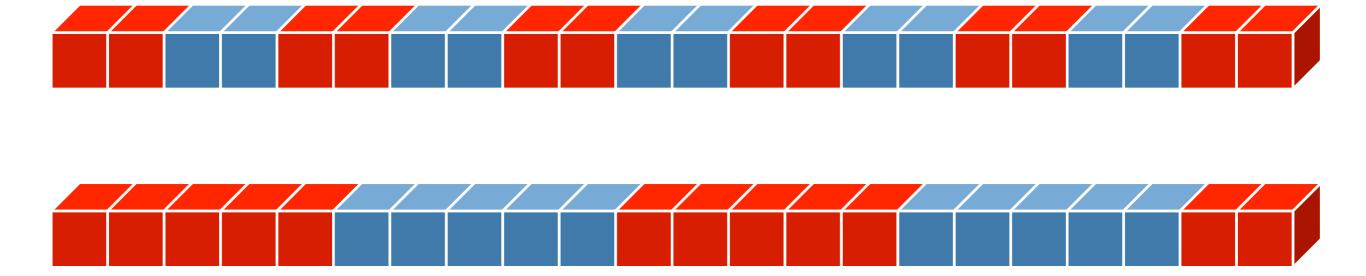
 $f(x) = 50 (4)^{\frac{x}{3}}$  $g(x) = 400 \left(\frac{1}{2}\right)^{\frac{x}{3}}$ 

 $h(x) = 100 \, (3)^{\frac{x}{2}}$ 





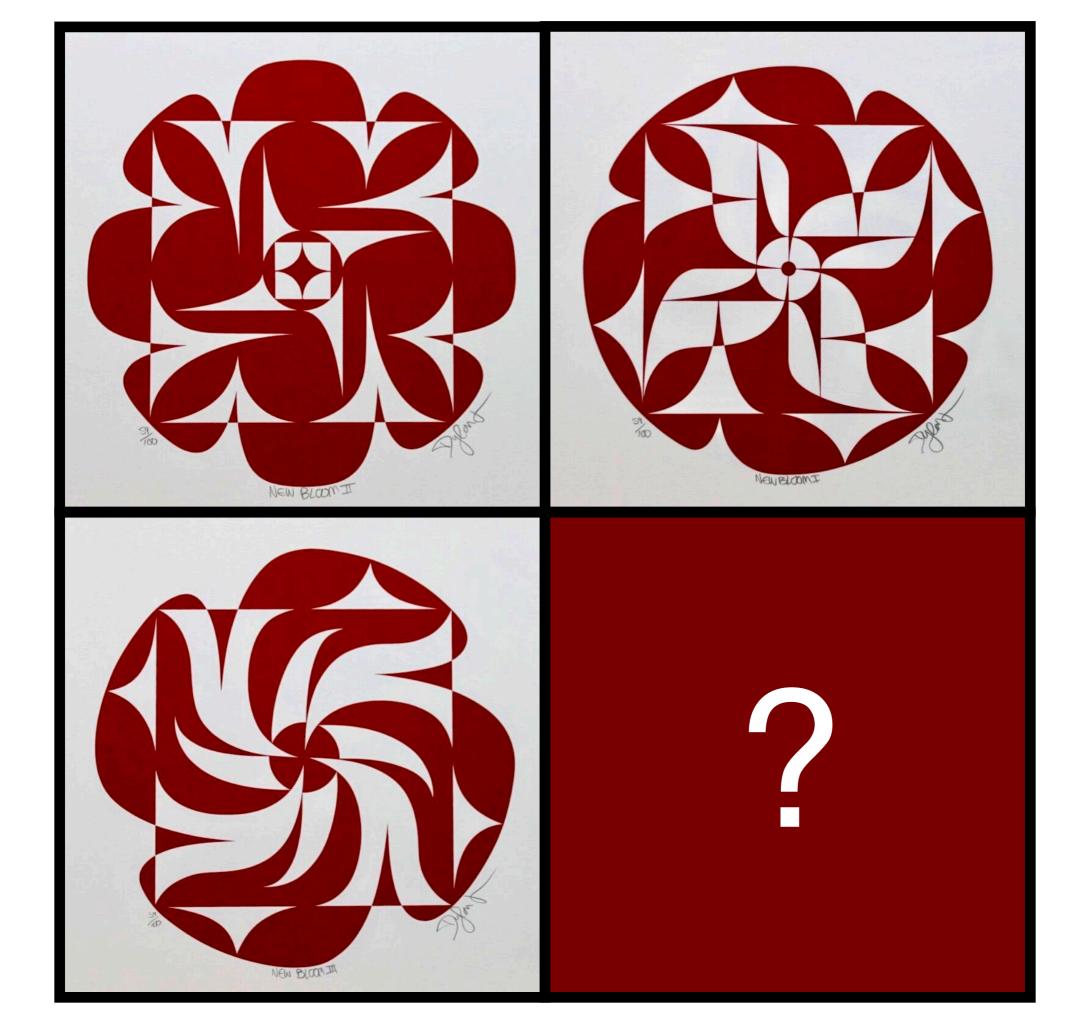
















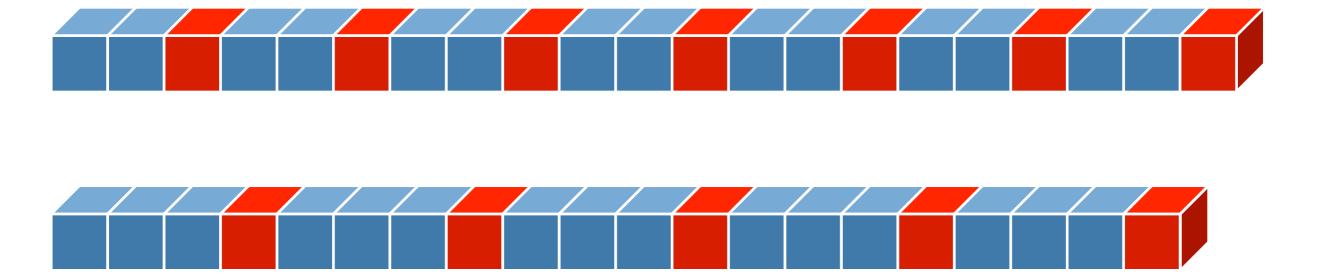


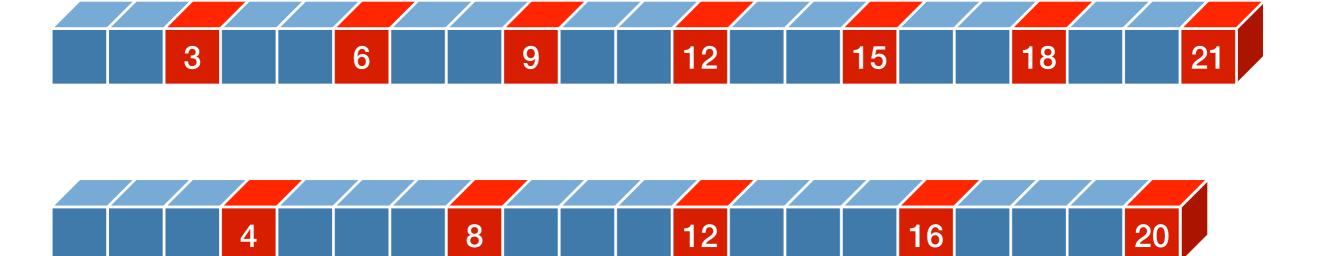


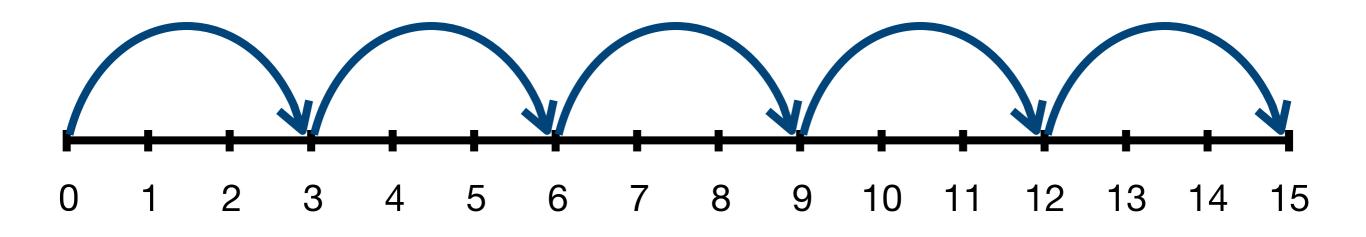
00 0000 0000 0000 00 00 0000 0000 0<sup>0</sup>0 0000 0<sup>0</sup>0 00 00 0<sup>0</sup>0 0<sup>0</sup>0 00 °°0 00 °0 00 000 0°0 00 0<sup>0</sup>0 00

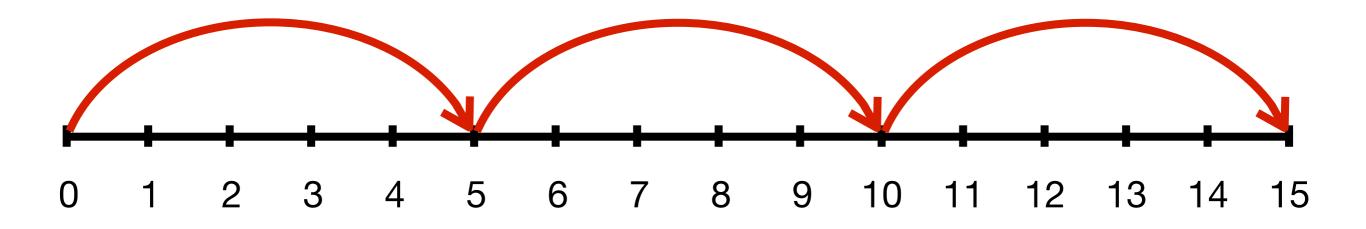
## Which two are most alike?

## Which two are most alike?









1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100





# Which one doesn't belong?



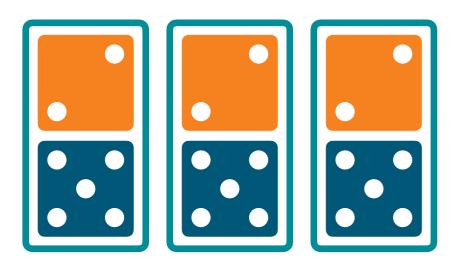
# Which one doesn't belong?

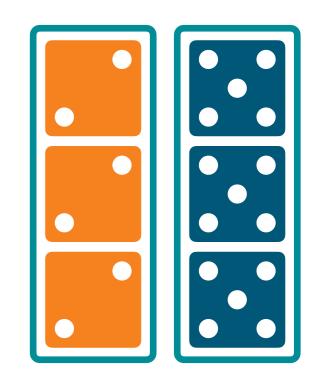


# Which one doesn't belong?



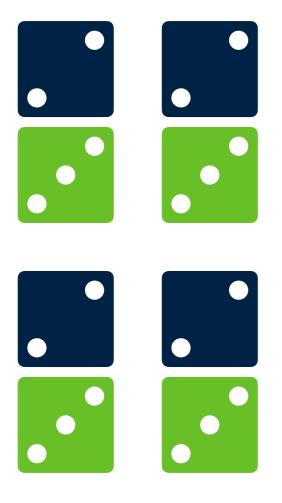
## What is the same?

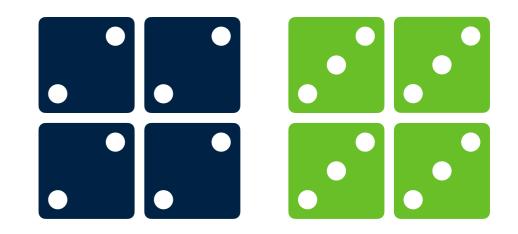




## What's different?

## What is the same?





What's different?



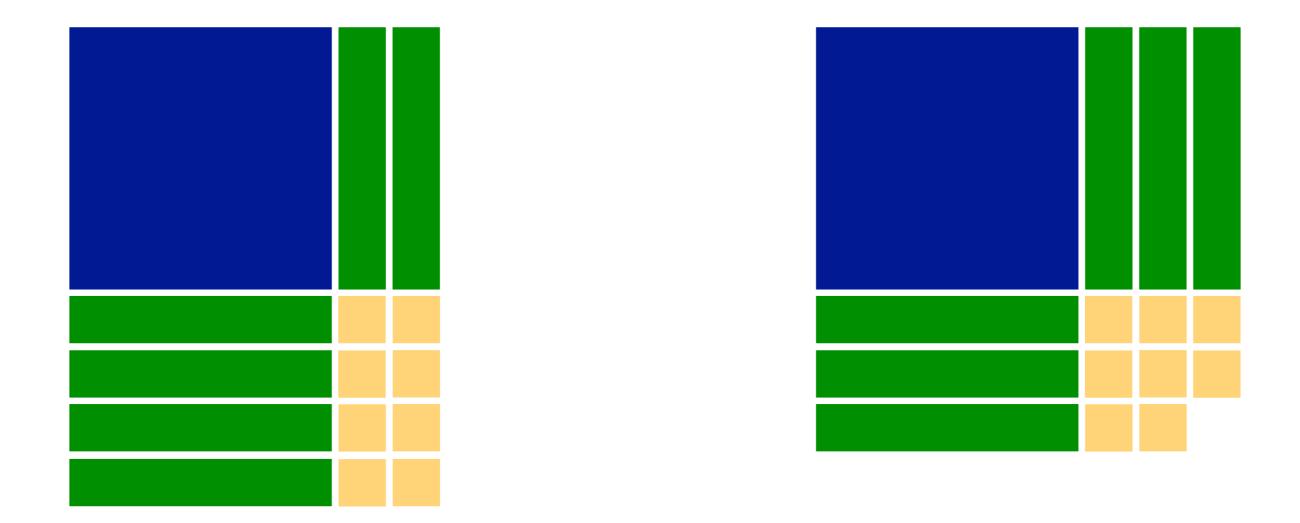


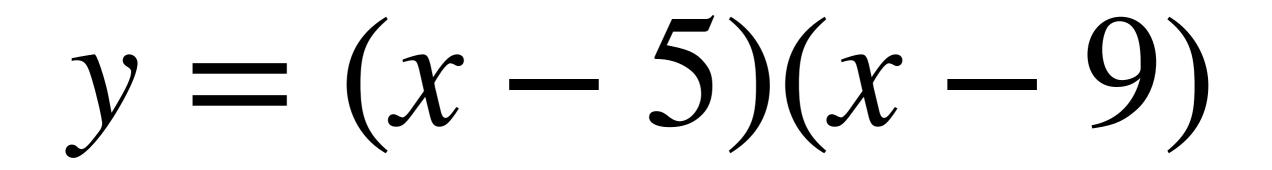




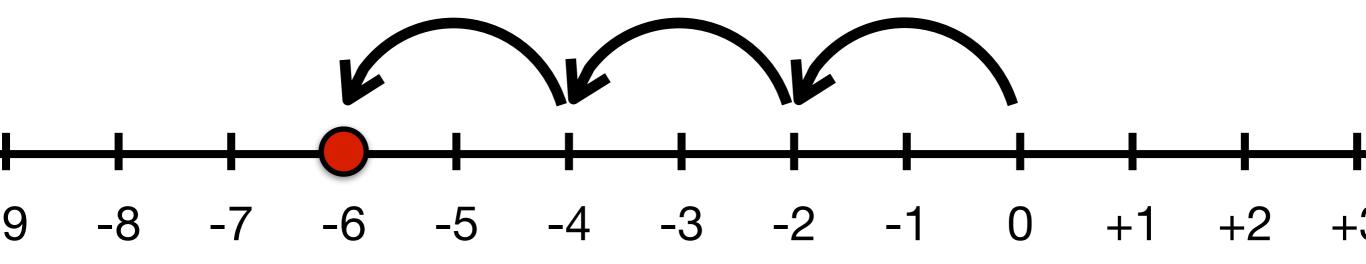


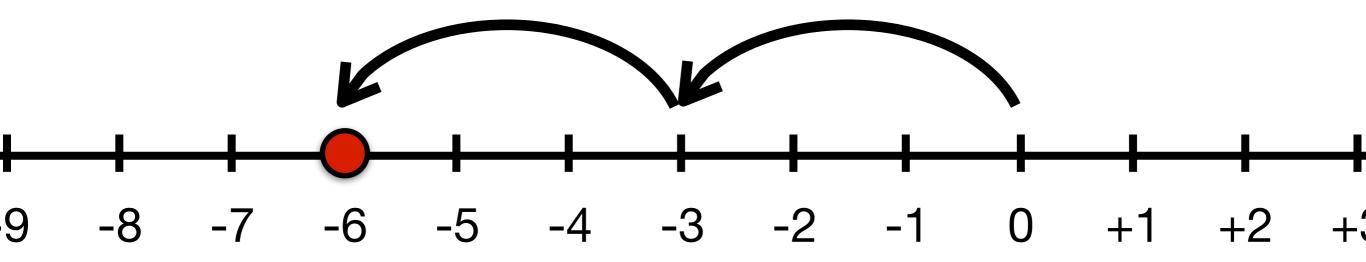


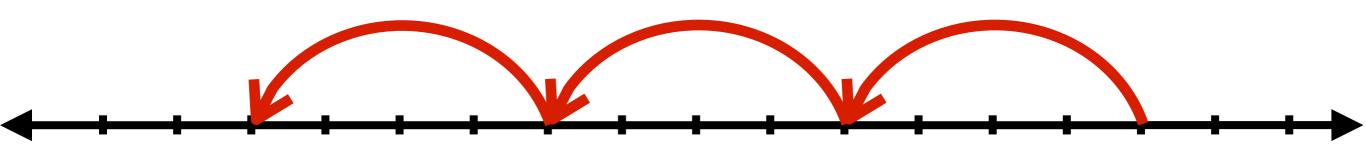




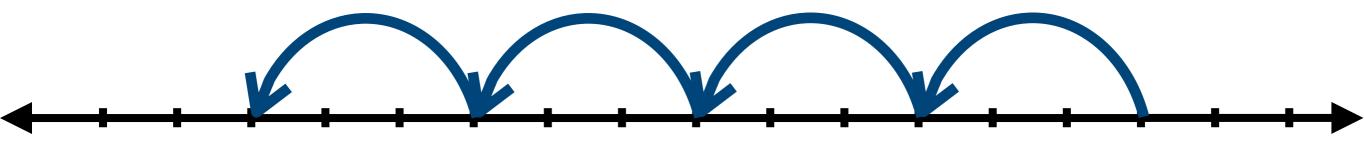
 $y = (x - 7)^2 - 4$ 







-1.4 -1.3 -1.2 -1.1 -1.0 -0.9 -0.8 -0.7 -0.6 -0.5 -0.4 -0.3 -0.2 -0.1 0.0 +0.1 +0.2



-1.4 -1.3 -1.2 -1.1 -1.0 -0.9 -0.8 -0.7 -0.6 -0.5 -0.4 -0.3 -0.2 -0.1 0.0 +0.1 +0.2



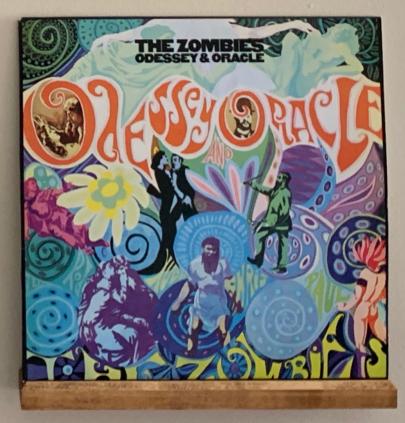






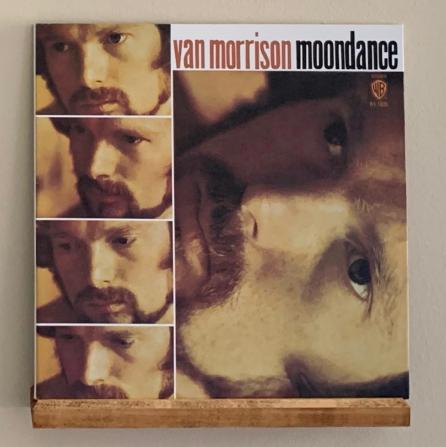




















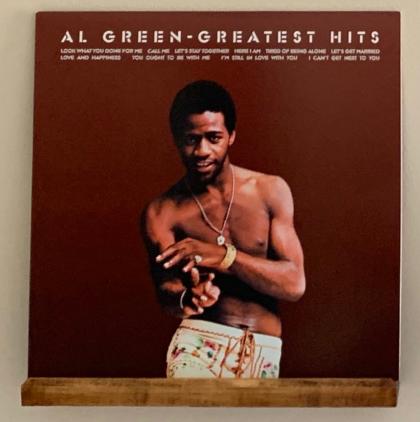


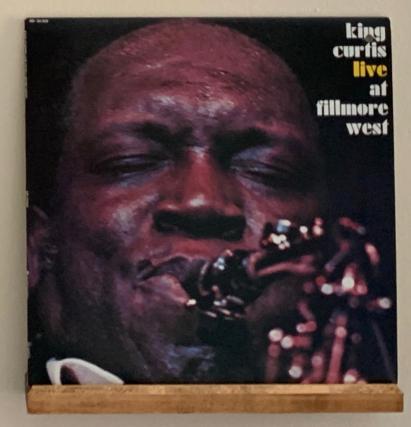








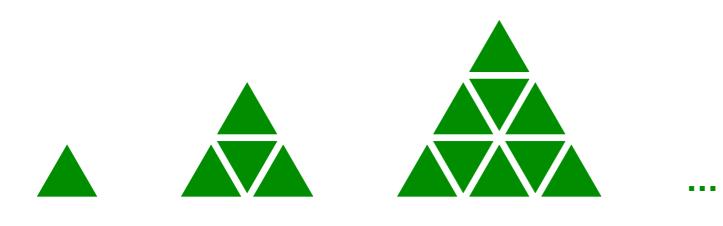




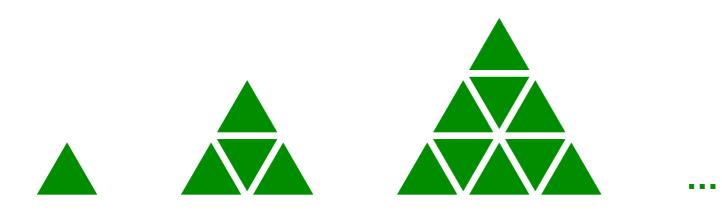


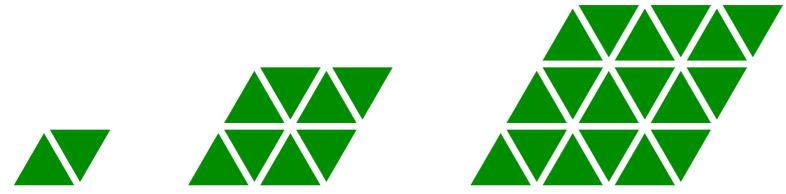




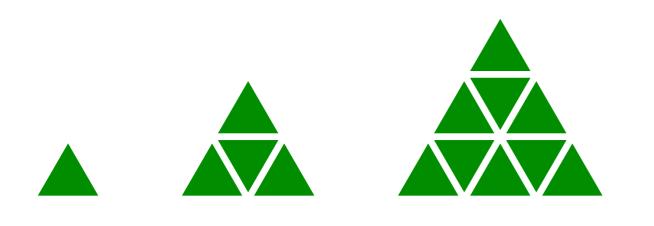


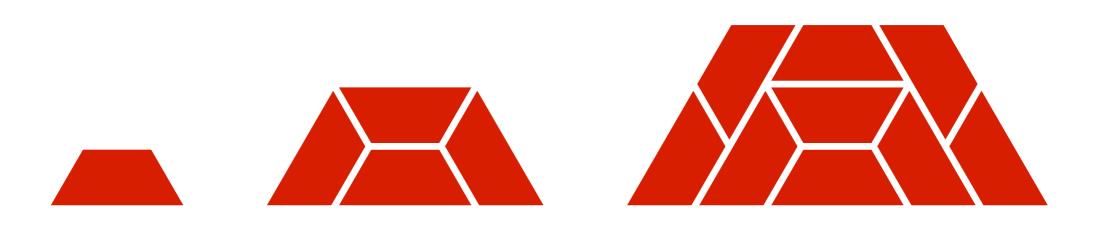




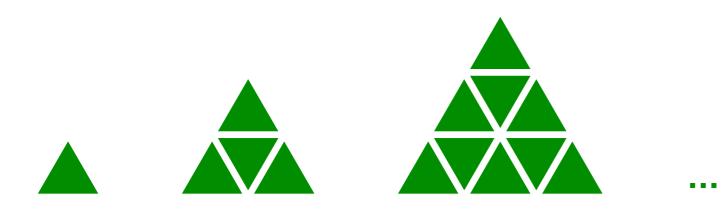


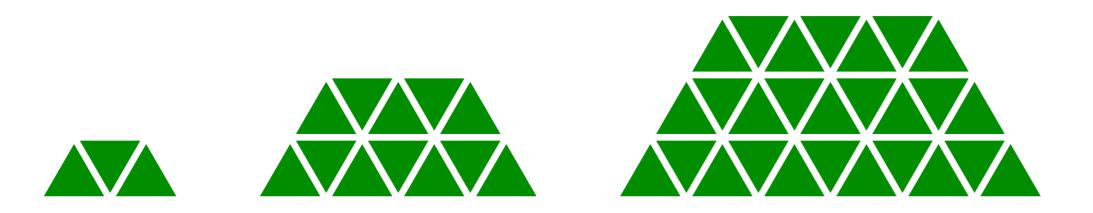
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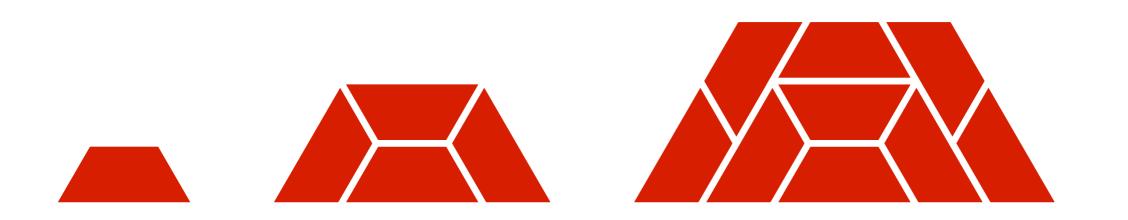


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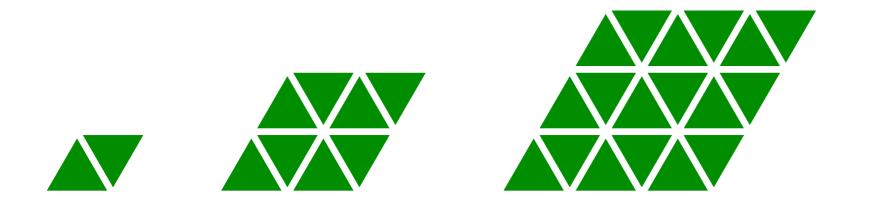


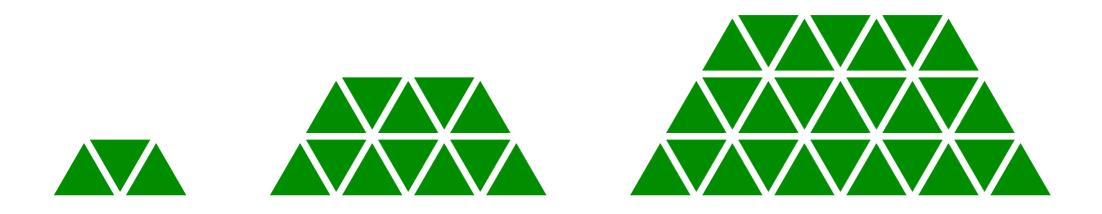






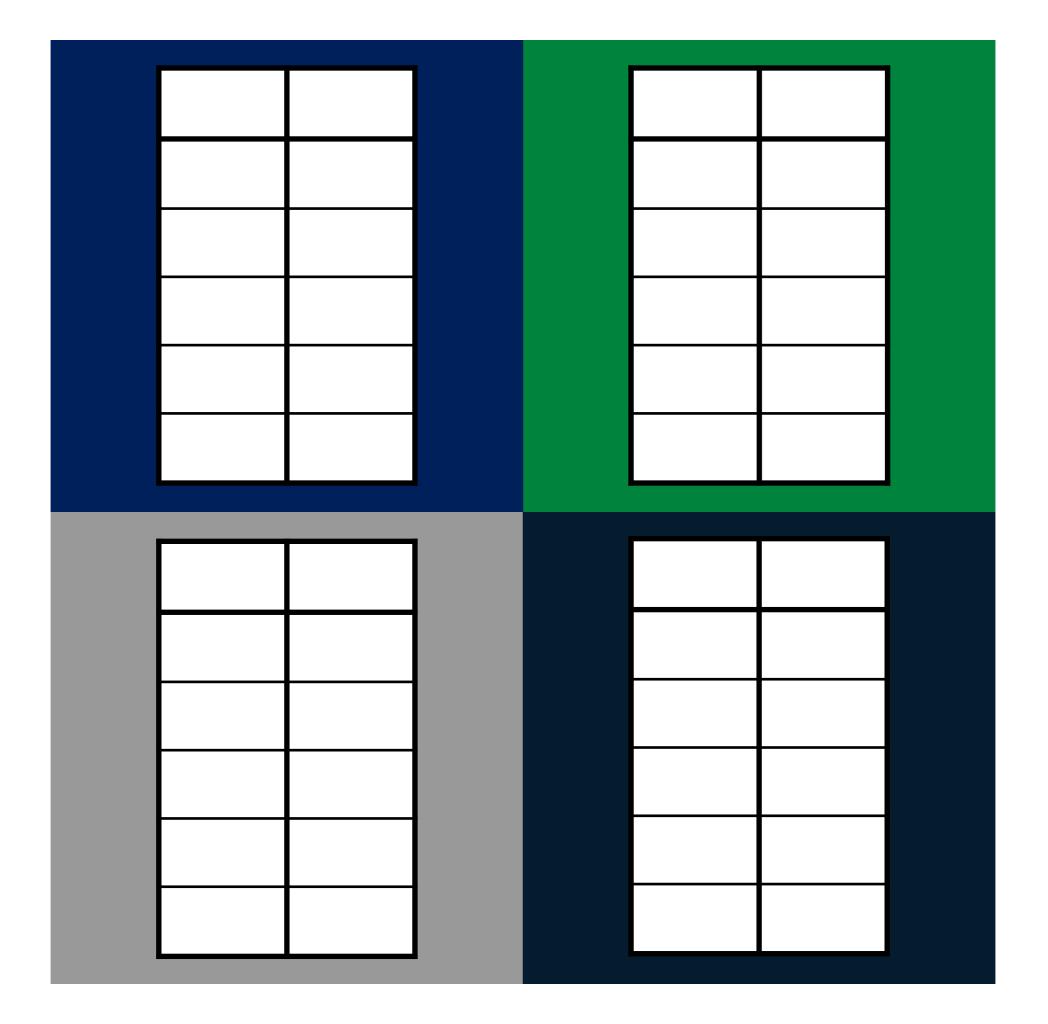
. . .





...

					•
x	y		x	y	
-4	-2		-2	4	
-2	-1		-1	1	
0	0		0	0	
2	1		1	1	
4	2		2	4	
x	y		x	y	
-1	0		-2	4	
0	1		-1	2	
0	-1		0	0	
1	2		1	-2	
1	-2		2	Δ	

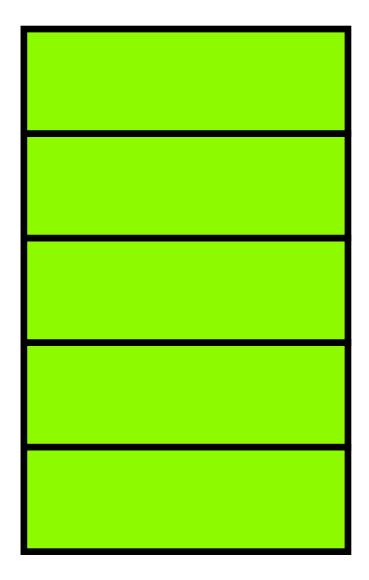








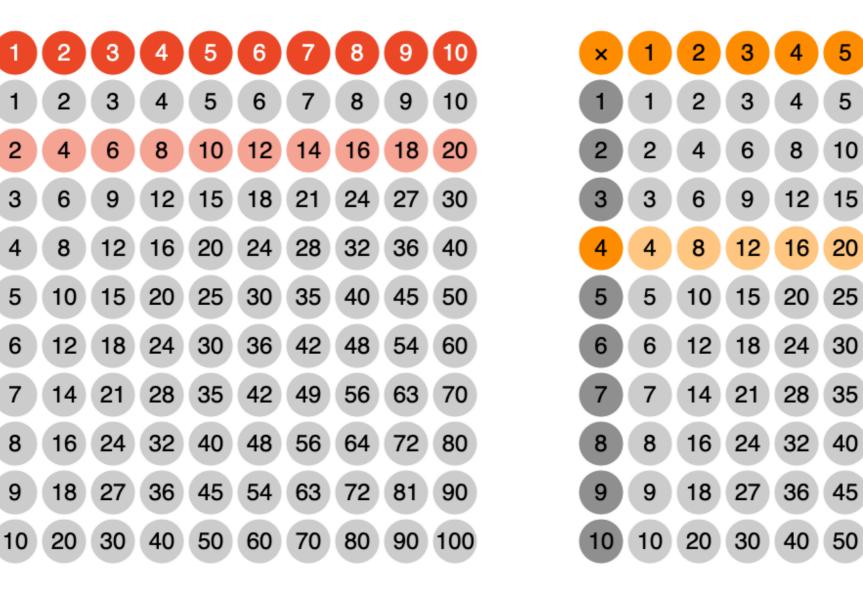


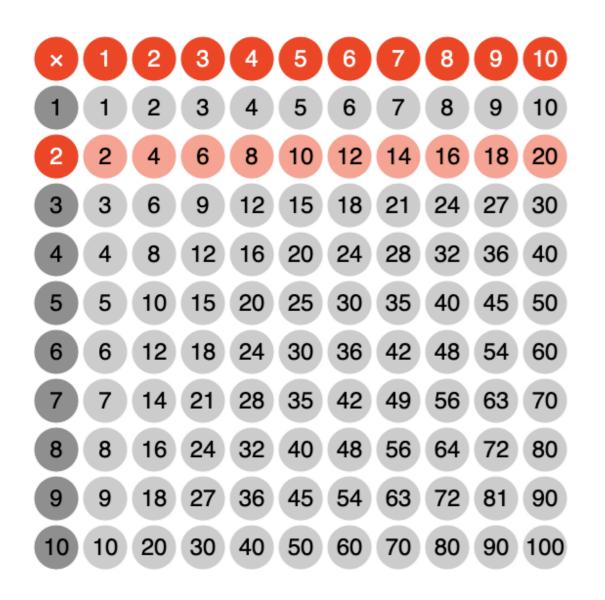




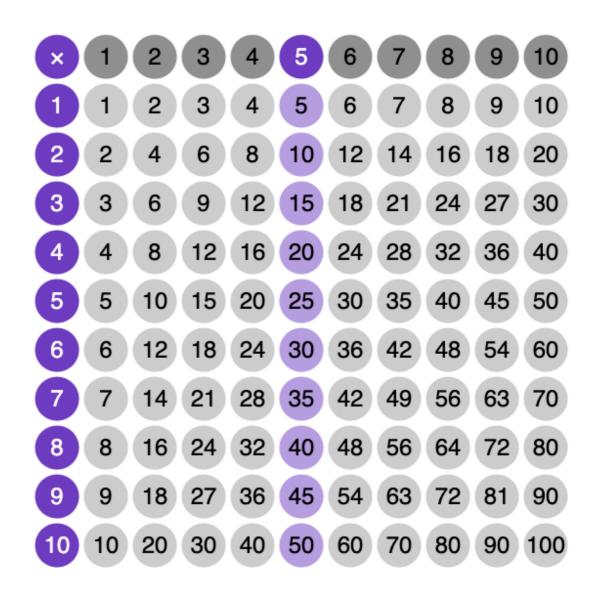


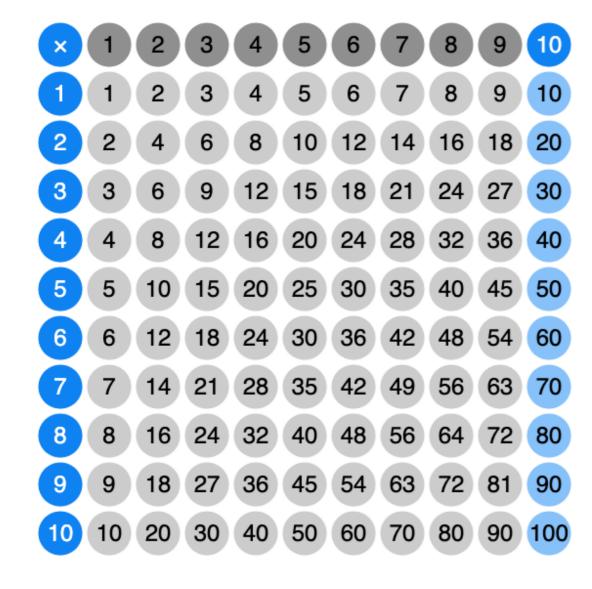
90 100

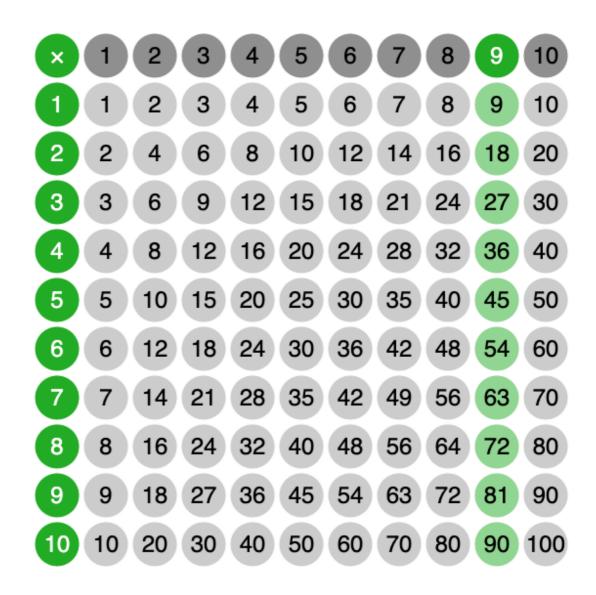


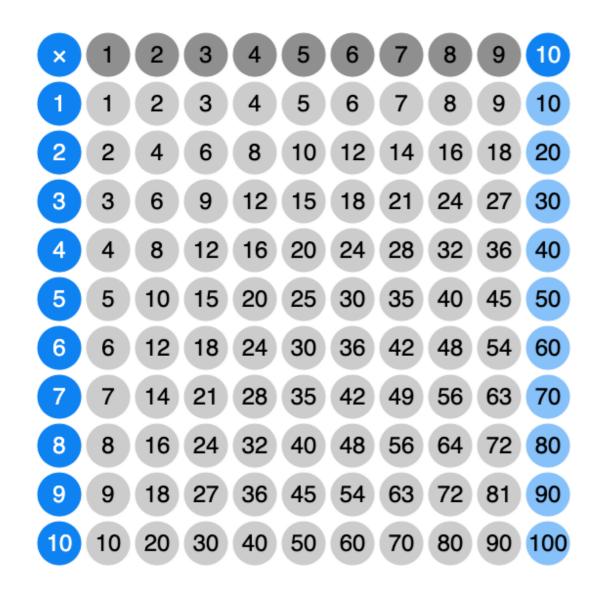


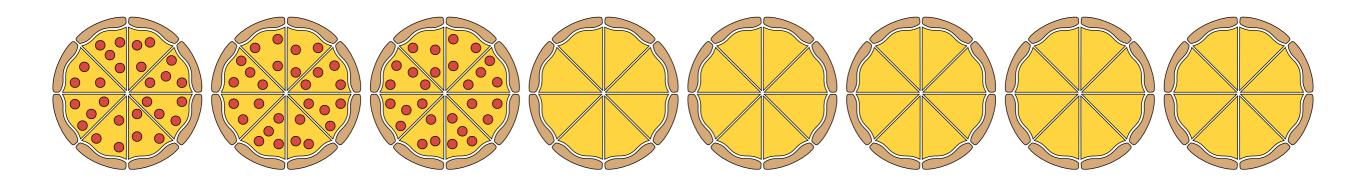


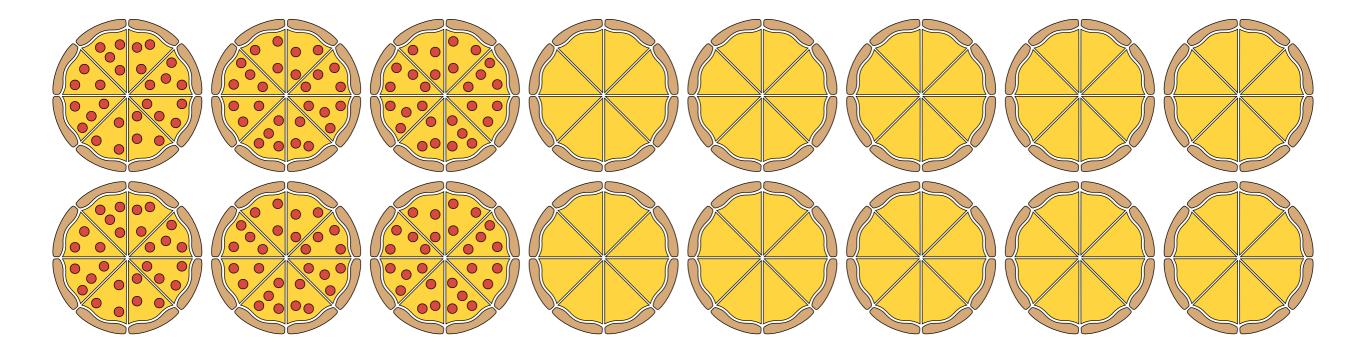






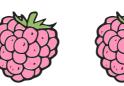


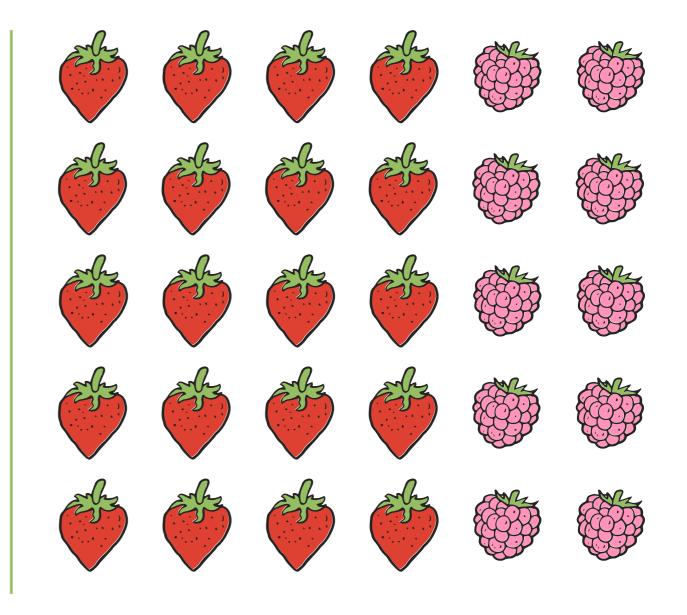


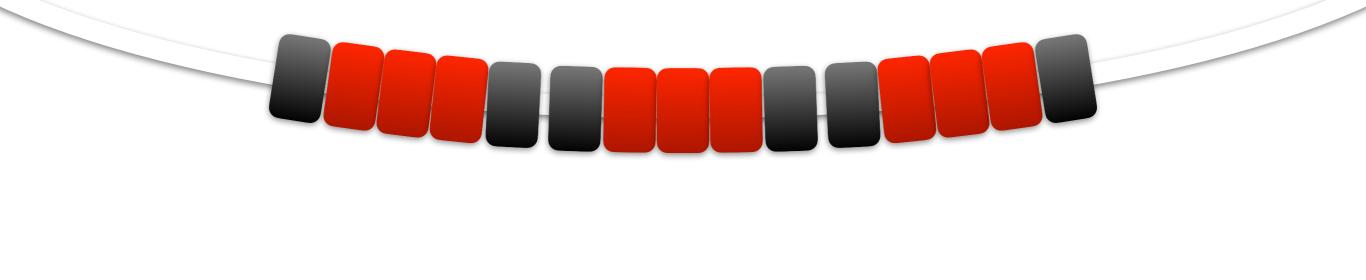


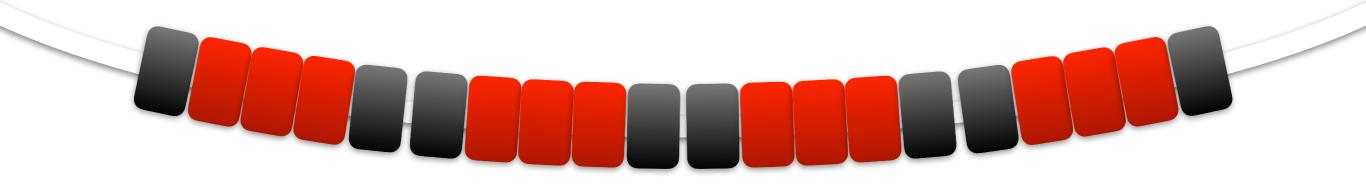


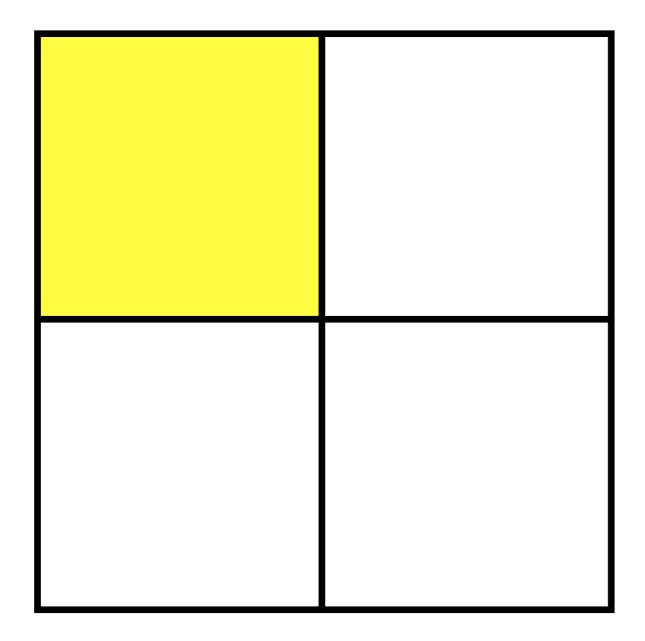


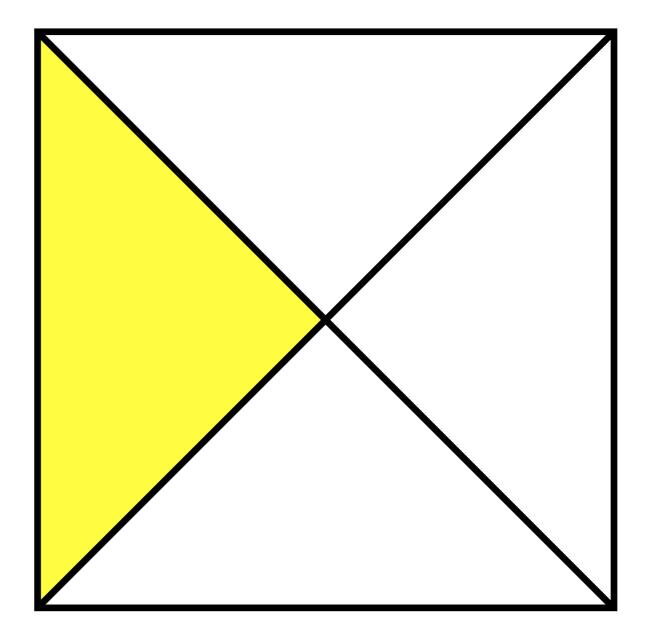


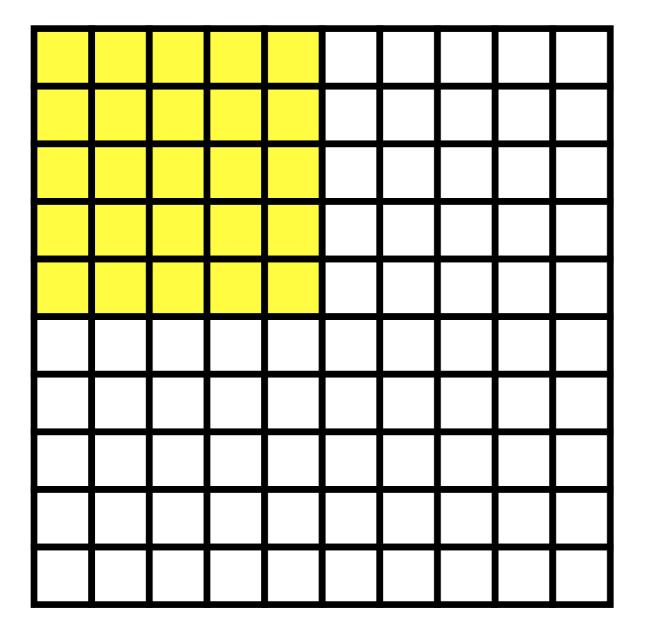








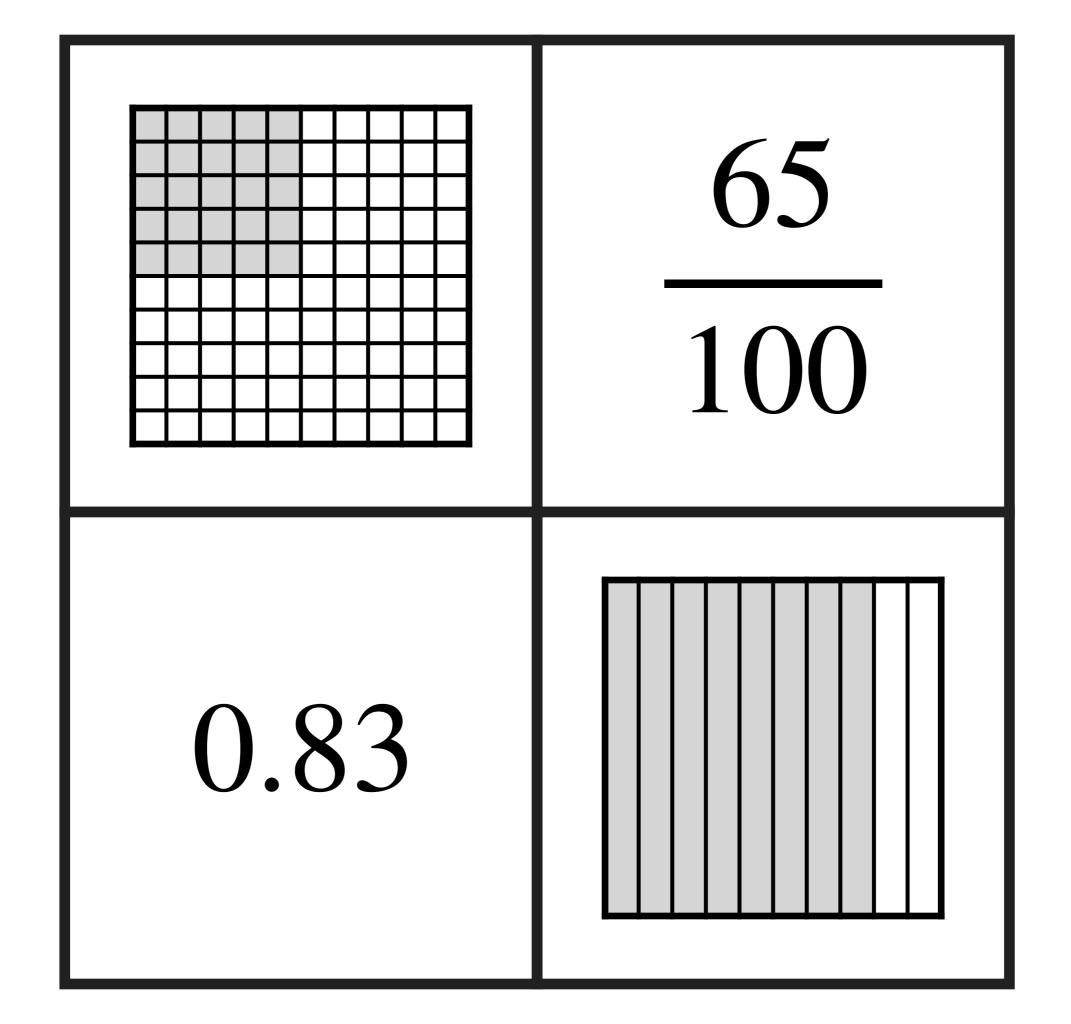


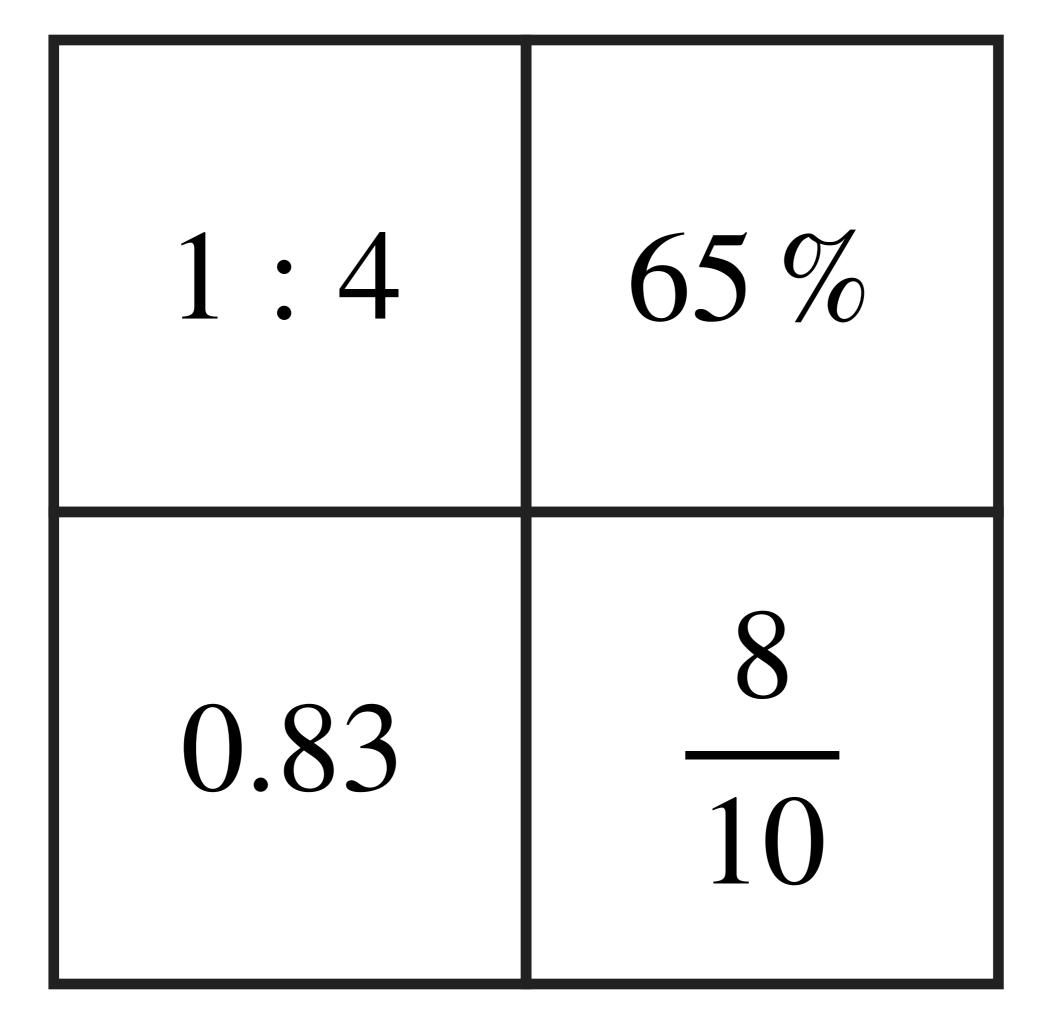


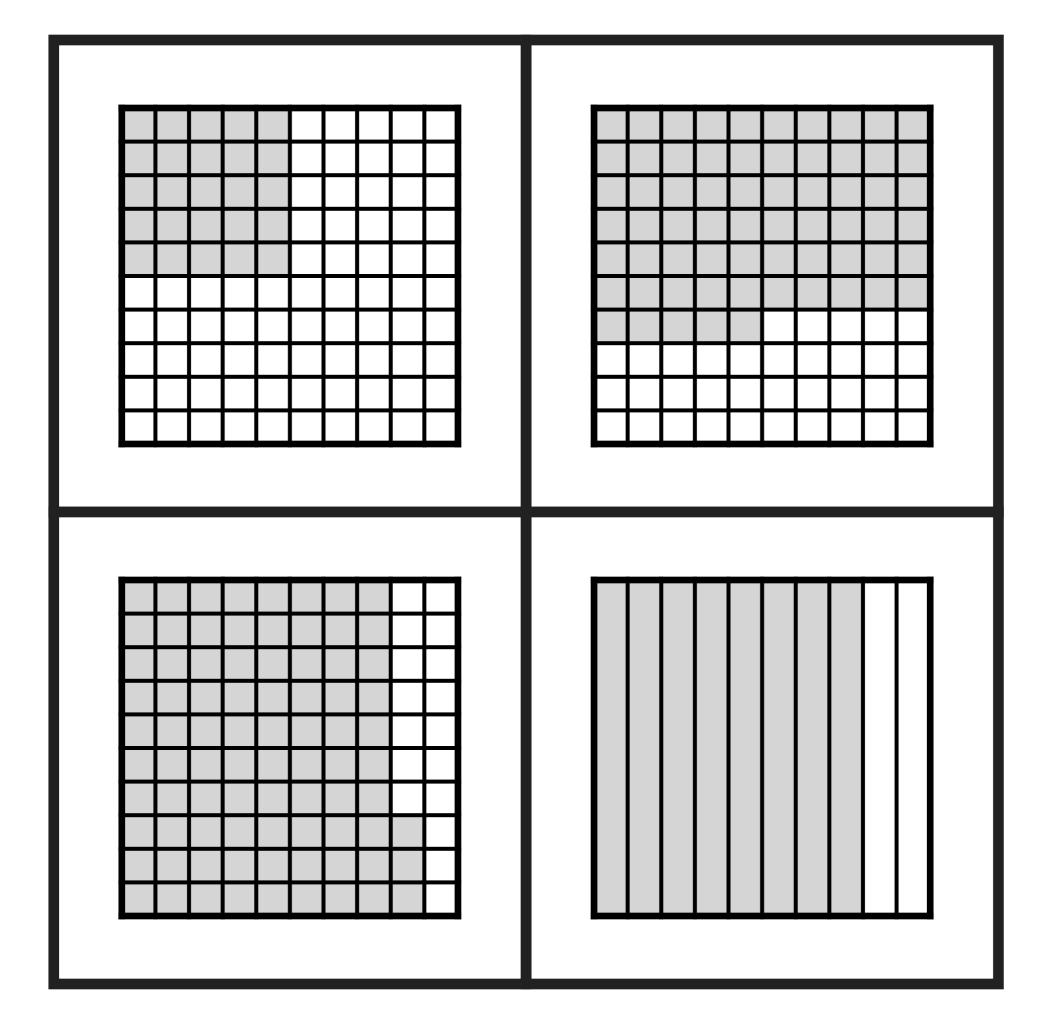
# $x^2 + 7x + 12$

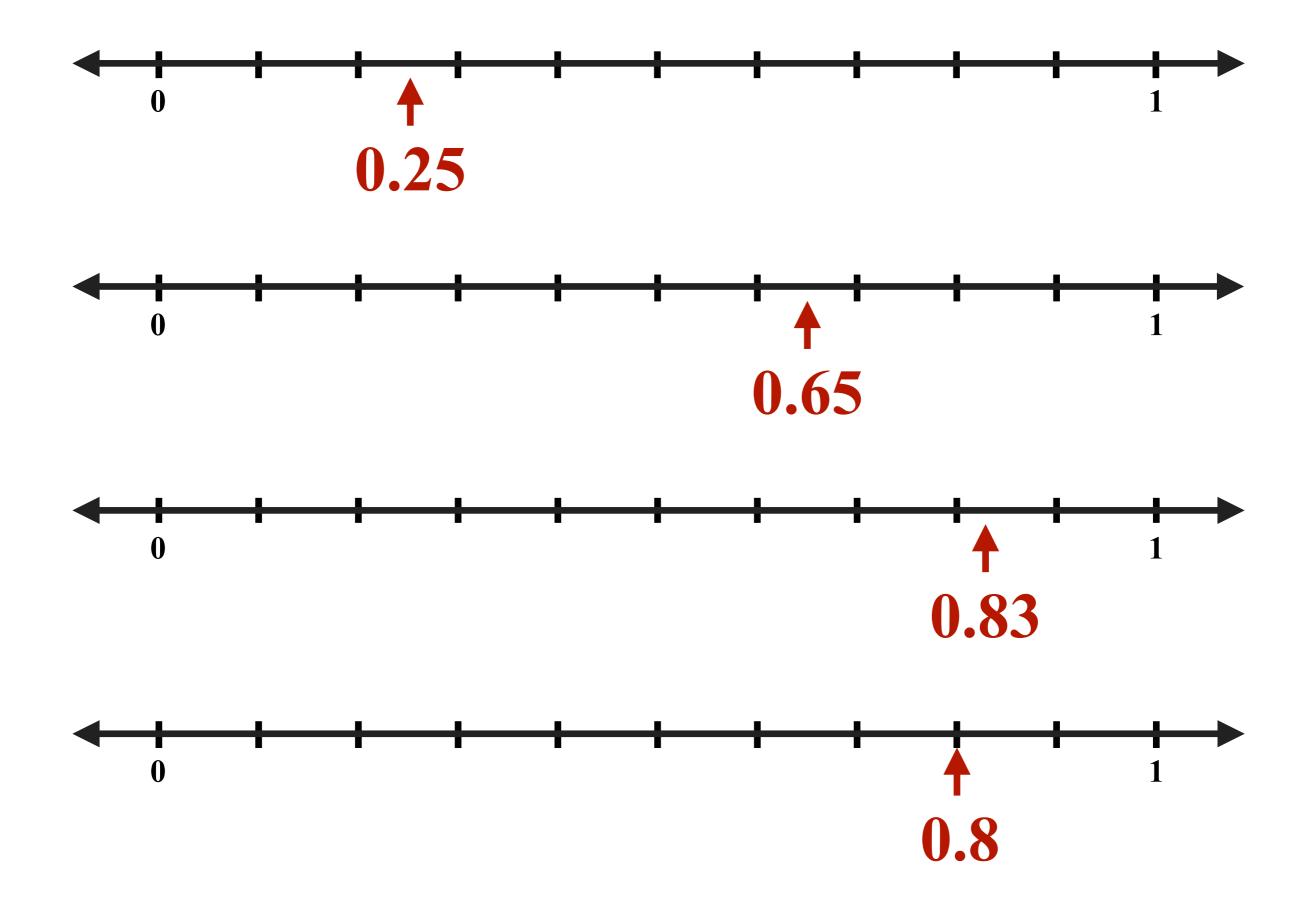
(x + 3)(x + 4)



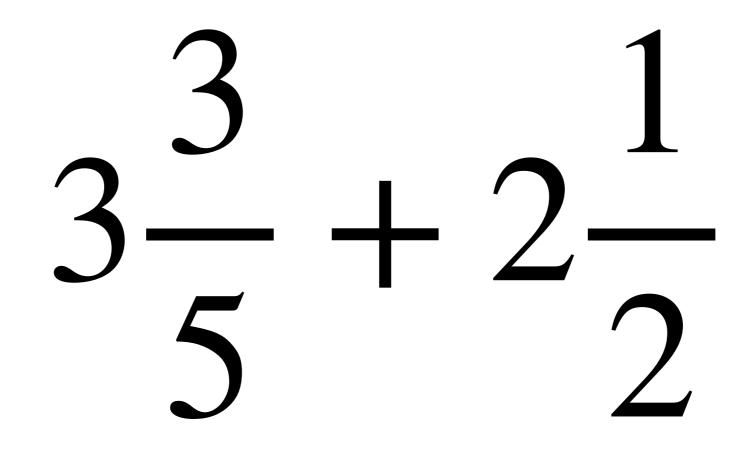




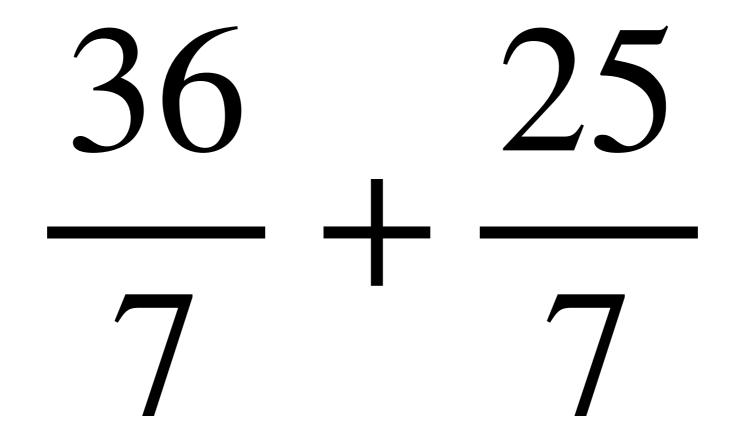




## 3.6 + 2.5

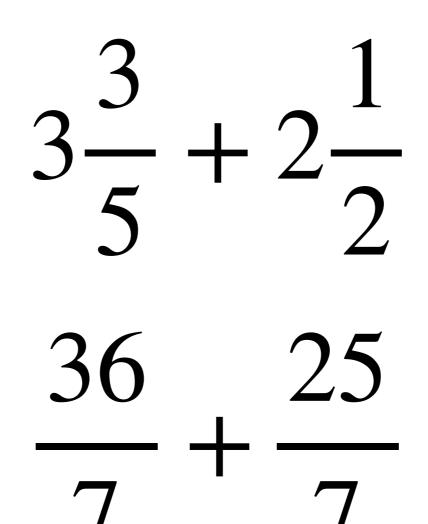


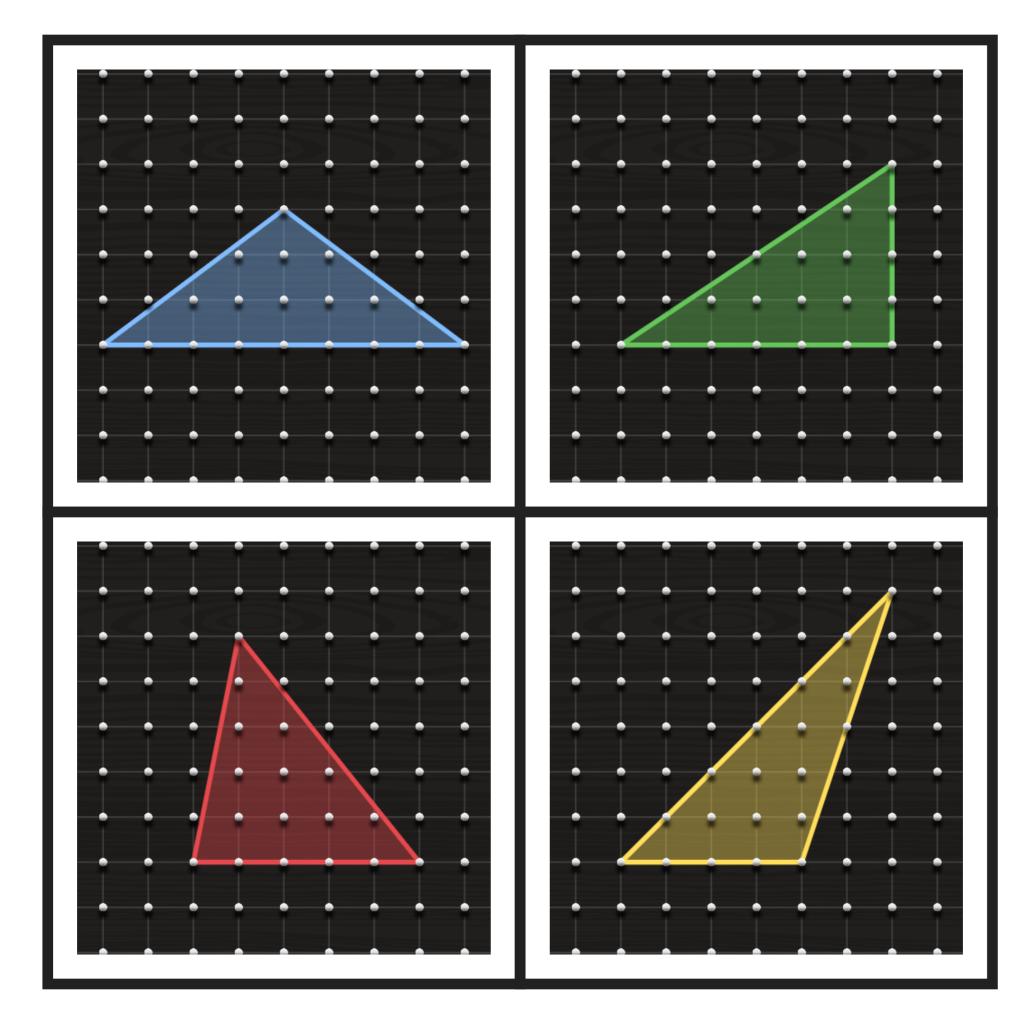
## 3.6 + 2.5

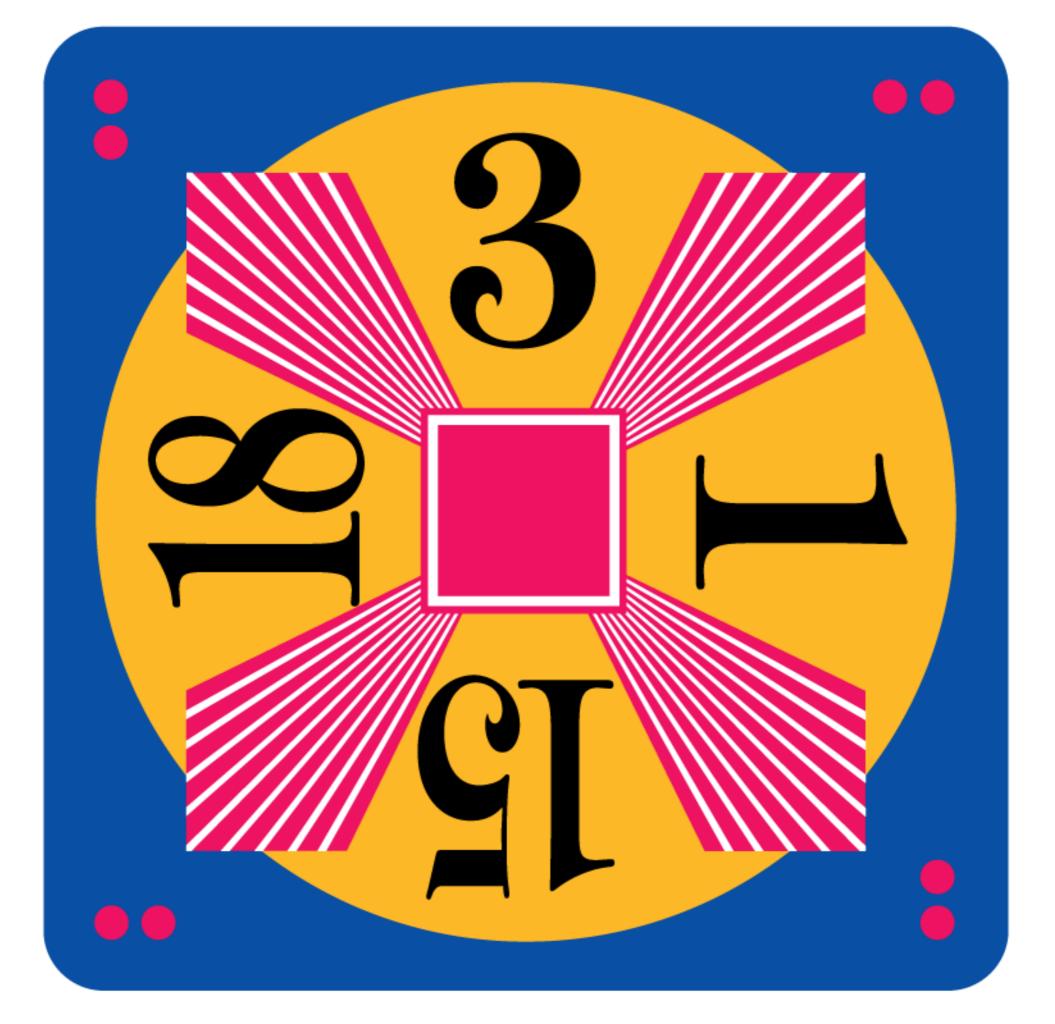


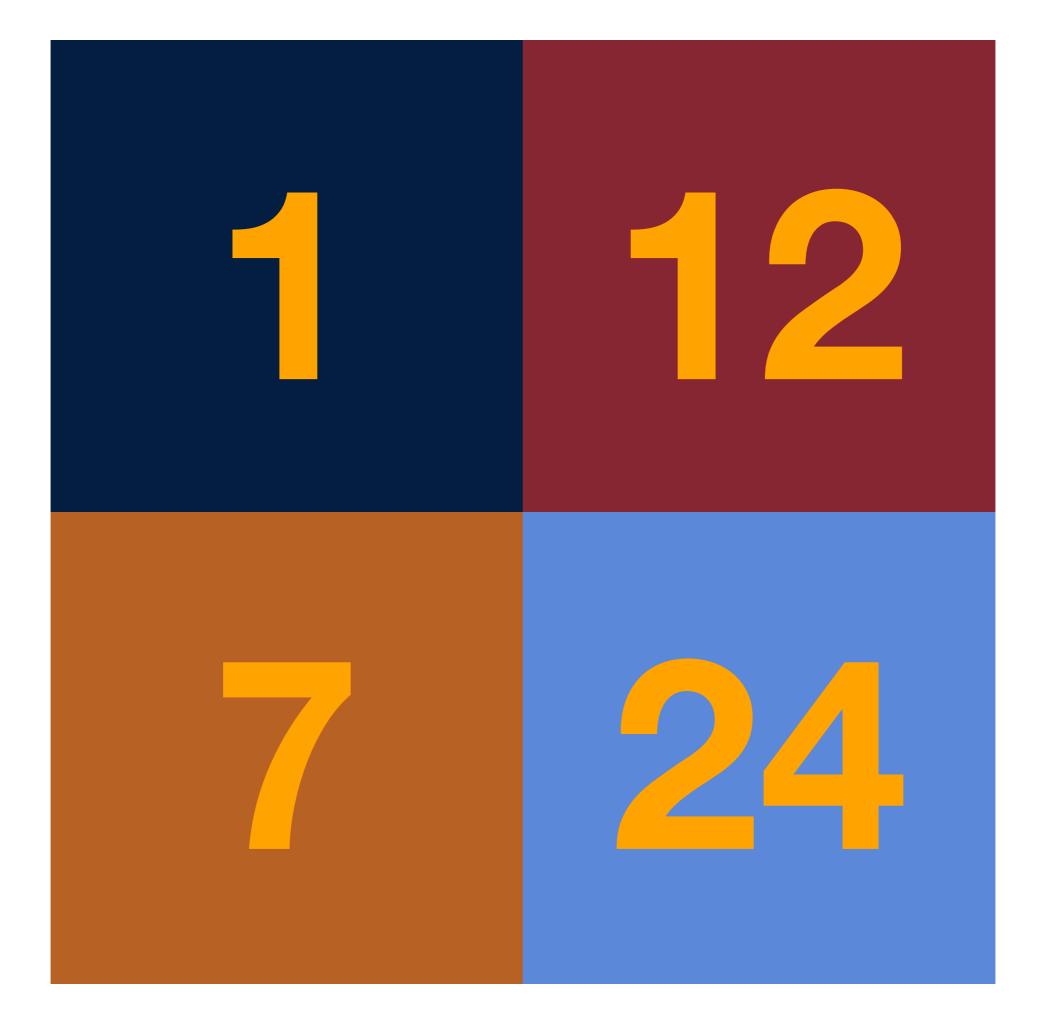
### Which two are most alike?

3.6 + 2.5

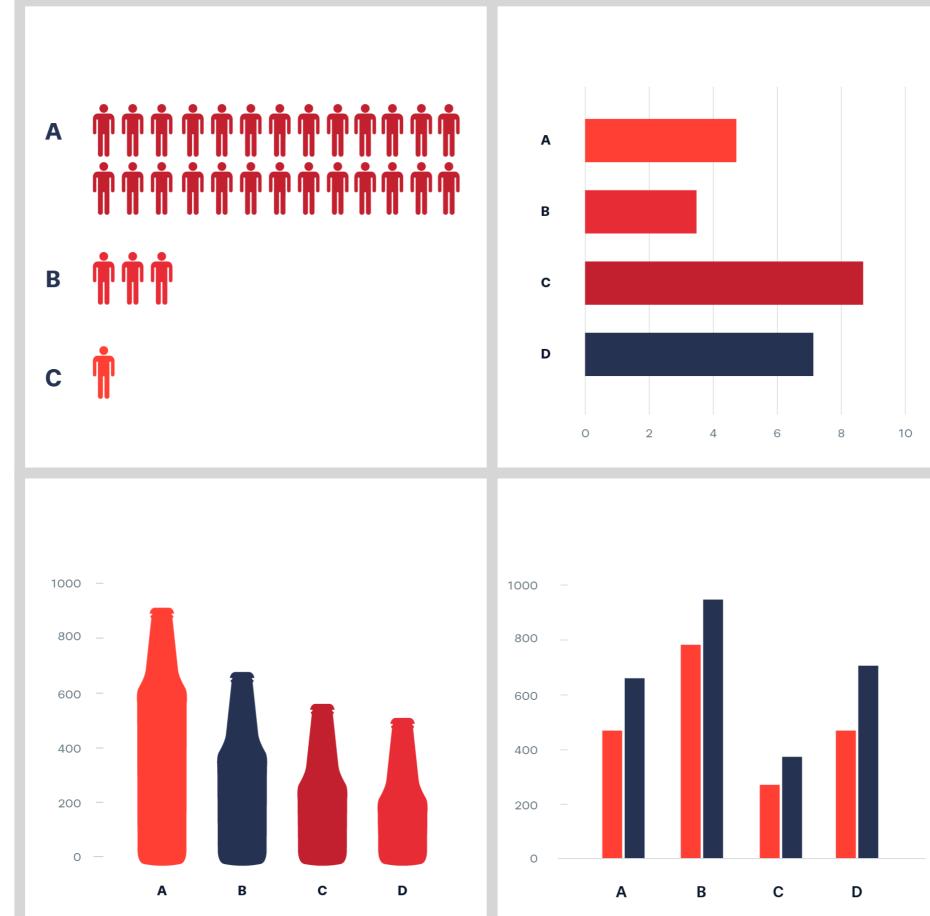












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