

Project name: Ditch Diggers

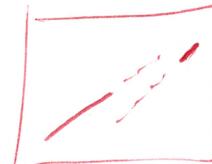
## Observations and doodles

Two diggers.

Two ditches

Day 1 → Day 10

Left one is digging faster.



## Questions

Are they digging in straight lines?  
Will they meet?

yes: where will they meet.

No: how far apart will they be?

When stop digging?

Need:  
Coordinates?

## Wrong answers and guesses (Goldilocks)

40 days before they meet; too large.

20 days is too little.

Solve + explain

State your question:

digger 1		
day	x	y
0	0	2
1	2	3
2	4	4
3	6	5
Day 4	8	6
	10	7

digger 2		
day	x	y
	68	34
	67	33.5
	66	33
	65	32.5
	64	32
	63	31.5

Are they digging in straight line?

YES  $\frac{\text{rise}}{\text{run}}$  is the same.

$$\text{slope } \frac{3-2}{2-0} = \boxed{\frac{1}{2}}$$

$$\frac{34-33}{68-66} = \boxed{\frac{+1}{2}}$$

$$\boxed{y = 2 + \frac{1}{2}x}$$

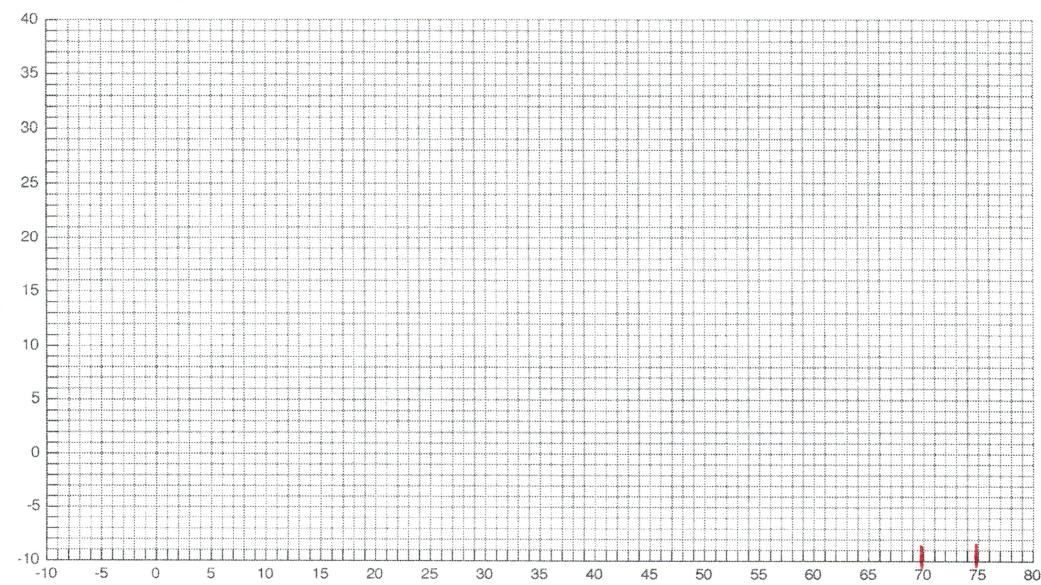
$$\boxed{y = \frac{1}{2}x}$$

Meet?  $2 + \frac{1}{2}x = \frac{1}{2}x$   
 $2 \geq 0$  X never meet!

$$\begin{cases} x = 2d \\ y = 2 + d \end{cases}$$

$$\begin{cases} x = 68 - 1 \cdot d \\ y = 34 - \frac{1}{2}d \end{cases}$$

## Ditch Diggers



days	digger 1 x, y	digger 2 x, y
0	0, 2	68, 34
20	40, 22	48, 24
24	52, 28	42, 21
22	48, 26	44, 22
	44, 29	46, 23

very close

Distance

