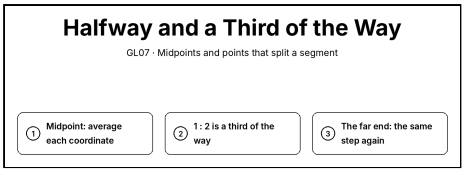
Halfway and a Third of the Way: teacher script

GL07-V1 · GL07 Midpoints and points that split a segment · teachers only. Without a screen, read each Say line and draw each Draw step on the board. About 56 seconds as a video.

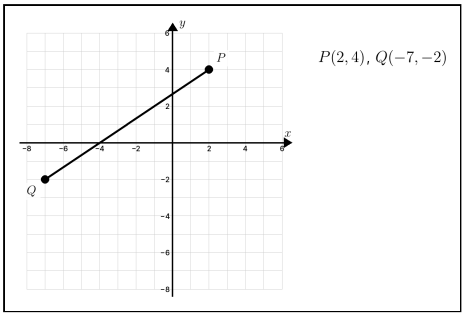
01



Say. Midpoints and splits. For the midpoint, average each coordinate. A ratio of 1 to 2 is a third of the way. And to find a far end, take the same step again.

Draw. Write the title “Halfway and a Third of the Way” and the steps: 1. Midpoint: average each coordinate; 2. 1 : 2 is a third of the way; 3. The far end: the same step again.

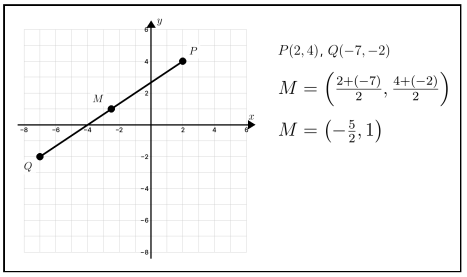
02



Say. P is 2, 4 and Q is negative 7, negative 2.

Draw. Clear the board and draw a grid with axes from -8 to 6. Plot (2, 4) and label it “P”. Plot (-7, -2) and label it “Q”. Draw a segment from (2, 4) to (-7, -2). Beside the grid, write “P(2, 4), Q(−7, −2)”.

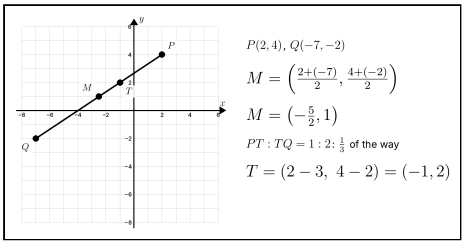
03



Say. For the midpoint M, average the x's and average the y's: M is negative 5 halves, 1.

Draw. Plot (-2.5, 1) and label it “M”. Beside the grid, write “M = \left(\tfrac{2 + (-7)}{2}, \tfrac{4 + (-2)}{2}\right)”. Beside the grid, write “M = \left(-\tfrac52, 1\right)”.

04



Say. Now the point T with P T to T Q equal to 1 to 2. That is 3 parts, and T is after the first: a third of the way. A third of negative 9 across and of negative 6 up gives T at negative 1, 2.

Draw. Plot (-1, 2) and label it “T”. Beside the grid, write “PT : TQ = 1 : 2: 1/3 of the way”. Beside the grid, write “T = (2 - 3,\ 4 - 2) = (-1, 2)”.

05

Trap $PT : TQ = 1 : 2$

$\times$ $\frac{1}{2}$ of the way

✓ $\frac{1}{3}$ of the way

Say. Watch for the trap: 1 to 2 isn't half. There are 3 parts, so it is a third of the way.

Draw. Clear the board. Write “Trap” and PT : TQ = 1 : 2. Below, write 1/2 of the way and cross it out ×. Then write 1/3 of the way with a tick ✓.

06

Trap midpoint of $(2, 4),\ (-7, -2)$

$\times$ $\left(\frac{-7-2}{2}, \frac{-2-4}{2}\right)$

✓ $\left(\frac{2+(-7)}{2}, \frac{4+(-2)}{2}\right)$

Say. And the second trap: half the difference isn't the midpoint. Add, then halve.

Draw. Clear the board. Write “Trap” and midpoint of (2, 4),\ (−7, −2). Below, write ((−7 − 2)/2, (−2 − 4)/2) and cross it out ×. Then write ((2 + (−7))/2, (4 + (−2))/2) with a tick ✓.

07

Your turn

Average each coordinate.
A ratio 1 : 2 is a third of the way.

Say. Now it is your turn. Treat x and y separately, and count the parts of the ratio.

Draw. Point to today’s activity: Average each coordinate. A ratio 1 : 2 is a third of the way.