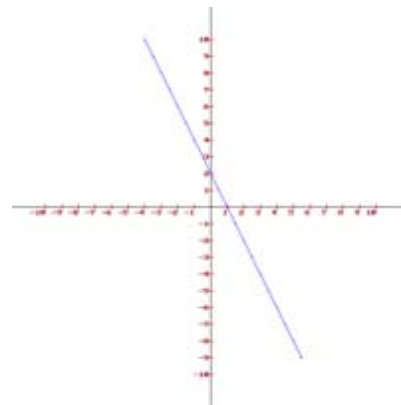


Dilations and Parallel Lines - Step-by-Step Lesson

Line ℓ has the equation $y = -2x + 2$.

Write the equation of the image of ℓ after dilation with a scale factor of 4, centered at the origin.

Write your answer in slope-intercept form.


Explanation:

Start with the y-intercept. Since the equation of ℓ in slope-intercept form is $y = -2x + 2$, the y-intercept is $(0, 2)$.

Next, since the slope of ℓ is -2 , which can be written as $-2/1$, move down 2 and right 1 from $(0, 2)$ to find a second point on ℓ $(1, 0)$.

So the points $(0, 2)$ and $(1, 0)$ lie on ℓ , apply the dilation $(x, y) = (4x, 4y)$.

$$(0, 2) = (0, 8)$$

$$(1, 0) = (4, 0)$$

Next, use the slope formula to find the slope of ℓ'

$$\begin{aligned}
 \text{slope of } \ell' &= \frac{y_2 - y_1}{x_2 - x_1} && \text{Slope formula} \\
 &= \frac{0 - 8}{4 - 0} && \text{Plug in } y_2 = 0, y_1 = 8, x_2 = 4, \text{ and } x_1 = 0 \\
 &= \frac{-8}{4} && \text{Subtract} \\
 &= -4 && \text{simplify}
 \end{aligned}$$

Finally, since ℓ' has a slope of -2 and a y-intercept of 8, the equation of ℓ' in slope-intercept form is $y = -2x + 8$

