

GRAPHING  $y = \sin bx$ ,  $y = \cos bx$

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COEFFICIENT THAT STRETCHES / SHRINKS

A FUNCTION

-  $> 1$  A LARGE "b" COMPRESSES

( $\longrightarrow \longleftarrow$ )

$< 1$  A SMALL "b" EXPANDS

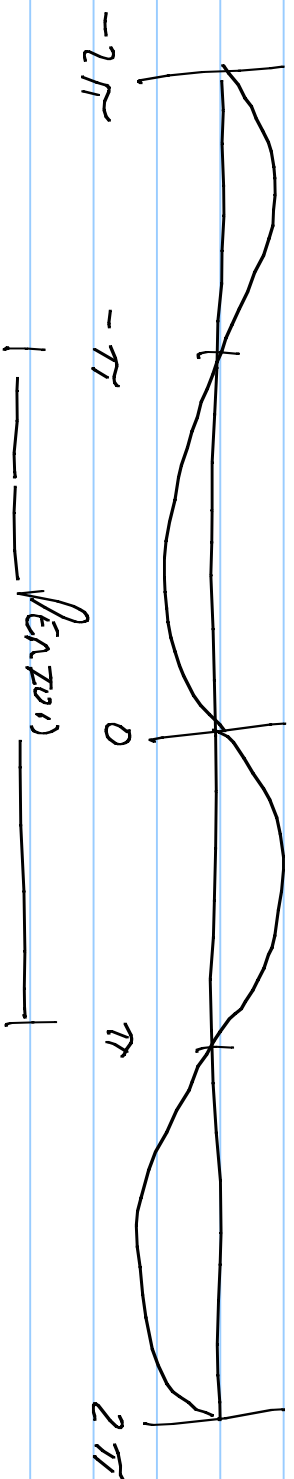
( $\longleftarrow \longrightarrow$ )

IF WHEN  $b = 3$ , THE COMPRESSION IS  $1/3$   
WITH  $b = 1/3$ , THE EXPANSION IS 3

- PERIOD  $\Rightarrow$  THE LENGTH OF THE SHORTEST

PART OF THE GRAPH THAT REPEATS

(MEASURES ALONG THE X-AXIS).



$$\text{PERIOD} = \frac{2\pi}{b}, \quad b > 0$$

DE BEWARE  $f(x) = 2 \cos 3 \left( x - \frac{\pi}{2} \right)$

$$y = a \cos b (x - c) + d$$

$a =$  AMPLITUDE

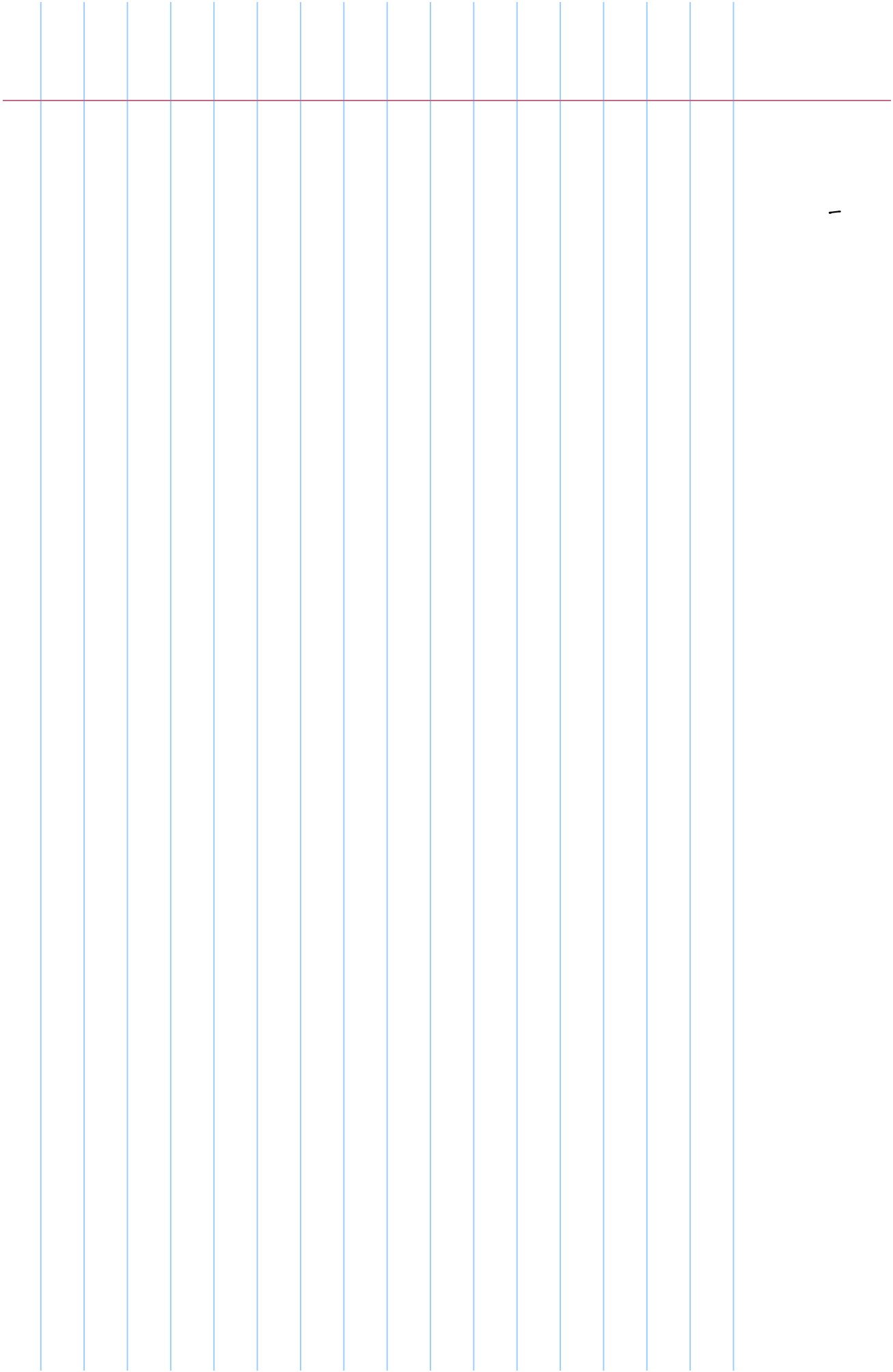
$b =$  HORIZONTAL EXP/COMP.

$c =$  HORIZONTAL TRANSLATIONS

$d =$  VERTICAL DISPLACEMENT

- AMPLITUDE = 2      PHASE SHIFT =  $\frac{\pi}{2}$  TO THE RIGHT

PERIOD =  $\frac{2\pi}{3}$       VERTICAL DISPLACEMENT = 0



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