

3. [11 points] Some values of a function $y = f(x)$ are given below.

x	-4	0	1
$f(x)$	0	2	-3

Let $j(x)$ be the function whose graph is obtained by performing the following transformations to the graph of $f(x)$, in the following order:

1. A horizontal compression by a factor of $\frac{1}{2}$. -2 0 $\frac{1}{2}$
2. A horizontal shift to the right by 1. -1 1 $\frac{3}{2}$
3. A vertical stretch by a factor of 10. 0 20 -30
4. A reflection across the x -axis. 0 -20 30

a. [4 points] Use this information to fill out the table below. You do not need to show your work, but partial credit may be awarded for correct work.

x	<u>-1</u>	<u>1</u>	<u>$\frac{3}{2}$</u>
$j(x)$	<u>0</u>	<u>-20</u>	<u>30</u>

b. [4 points] Find a formula for $j(x)$ in terms of $f(x)$.

Answer: $j(x) = -10f(2(x-1))$

c. [3 points] Show that your answers to the table and formula match one another.

Note: you can still receive full credit for this part even if you find that they don't match but are not sure how to fix your answers (please note that this is what you have found), or you weren't able to do one or both parts above, but can explain how you would check that the answers match if you did have answers.

Use x -values from table in (a) in formula from (b)

$$\begin{aligned}
 & -10f(2(-1-1)) \\
 &= -10f(-4) \\
 &= -10 \cdot 0 \\
 &= 0
 \end{aligned}$$

use table of values for f (not j)

$$\begin{aligned}
 & -10f(2(1-1)) \\
 &= -10f(0) \\
 &= -10 \cdot 2 \\
 &= -20
 \end{aligned}$$

$$\begin{aligned}
 & -10f(2(\frac{3}{2}-1)) \\
 &= -10f(2 \cdot \frac{1}{2}) \\
 &= -10 \cdot f(1) \\
 &= -10 \cdot -3 \\
 &= 30
 \end{aligned}$$

result should be values in table from (a).