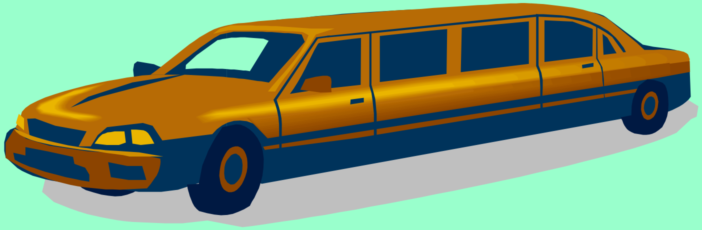
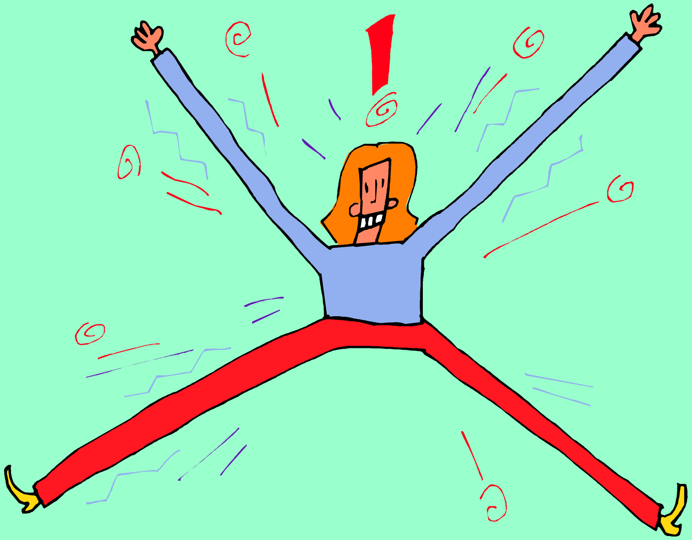


12.

Graph of kf(x)

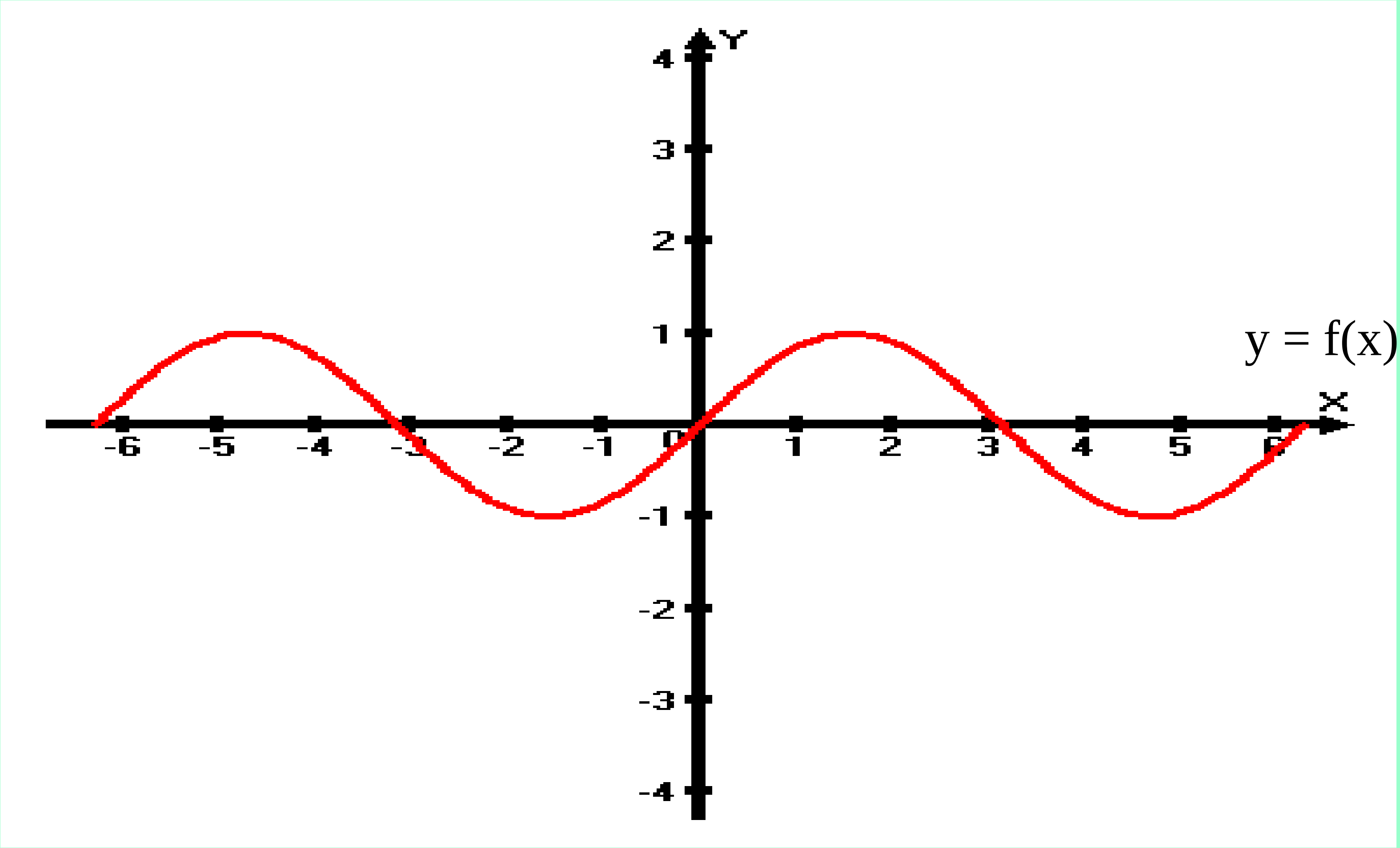


Graph of kf(x)

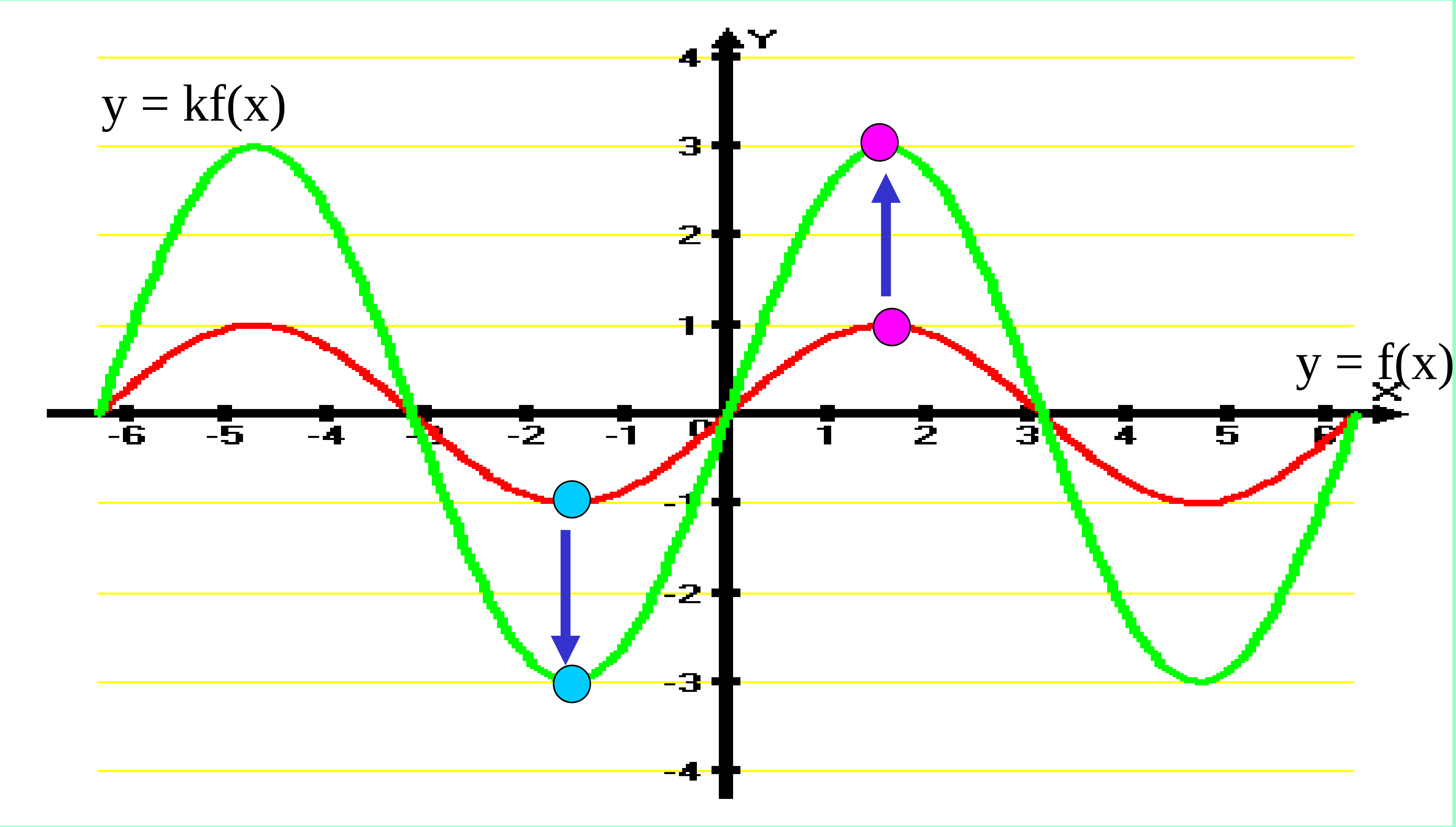
We are now going to look at what happens to f(x) if we multiply the whole function by a given value.

That is: $y = f(x) \rightarrow y = kf(x)$

This time we will start with the function y = sin(x) as trig graphs illustrate the effects most clearly:



What will happen if we change this to y = 3sin(x) ?



EFFECT : The x-coordinates are unchanged for corresponding points but the y-coordinates have been multiplied by a factor of k. The graph has not moved left or right.

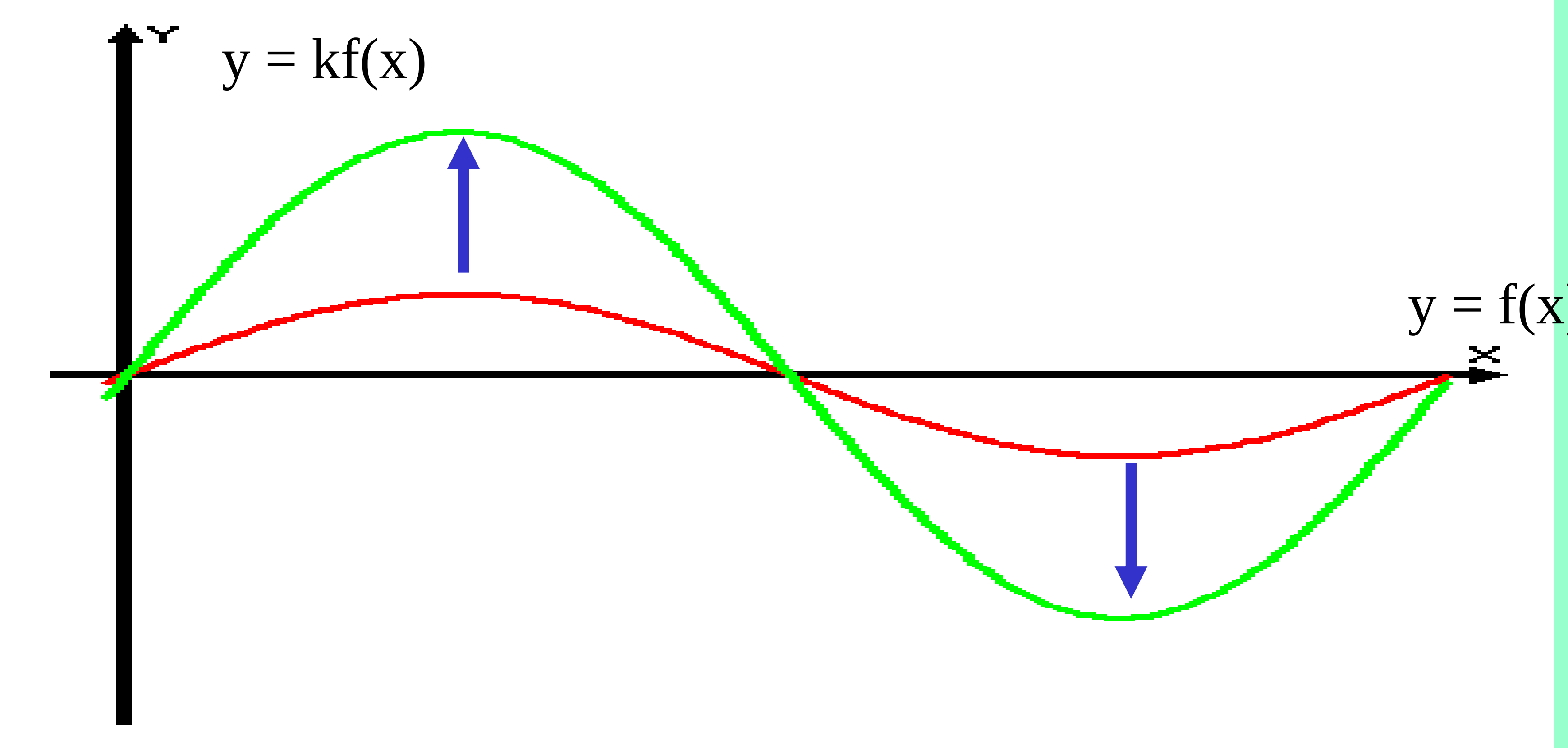
Graph of y =k f(x)

Copy the following:

To obtain graph of **y = kf(x)** the graph is multiplied by a factor of **k**.

Multiply the y-coordinate by k: $(a,b) \rightarrow (a,kb)$

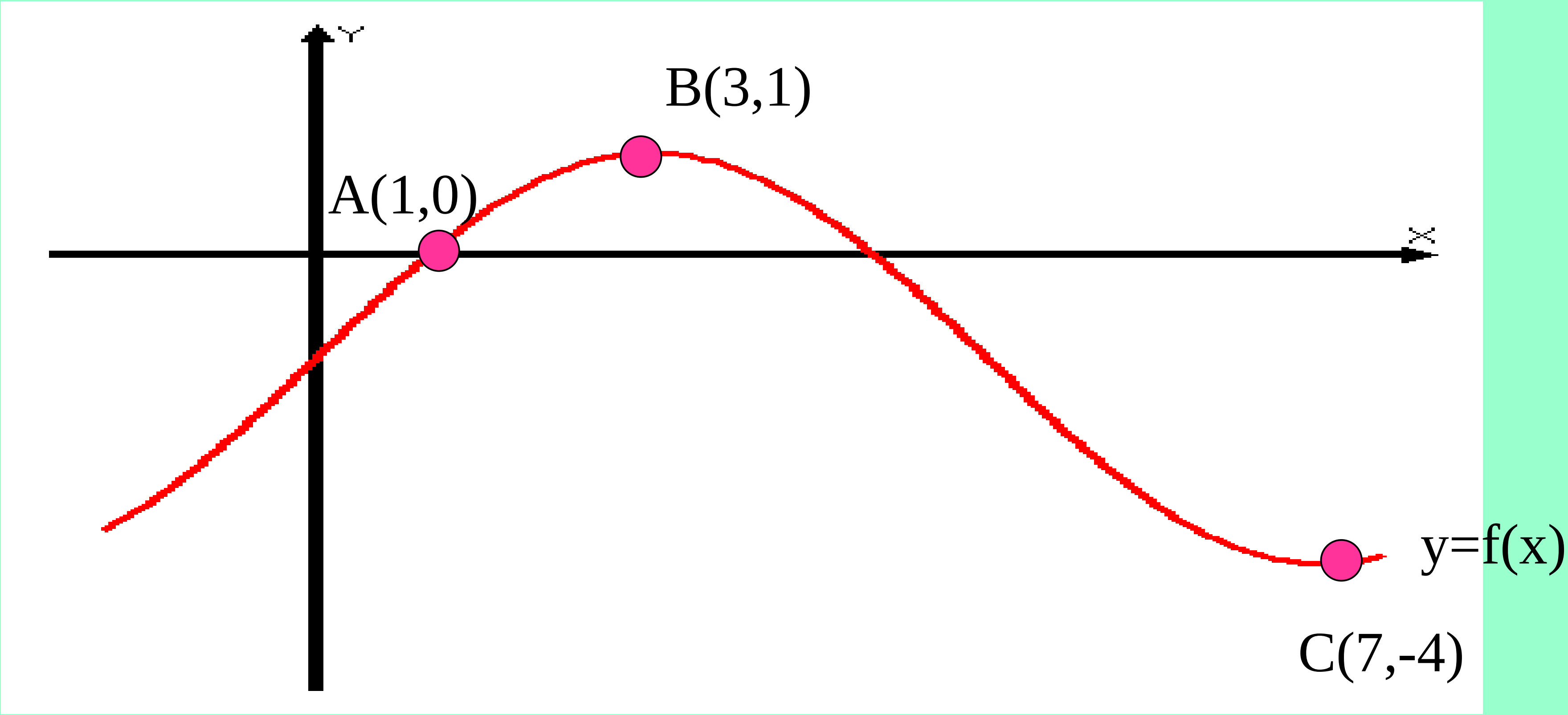
NOTE: If k > 1 then graph stretched If k < 1 then graph squashed



Example

Shown is the graph of f(x).

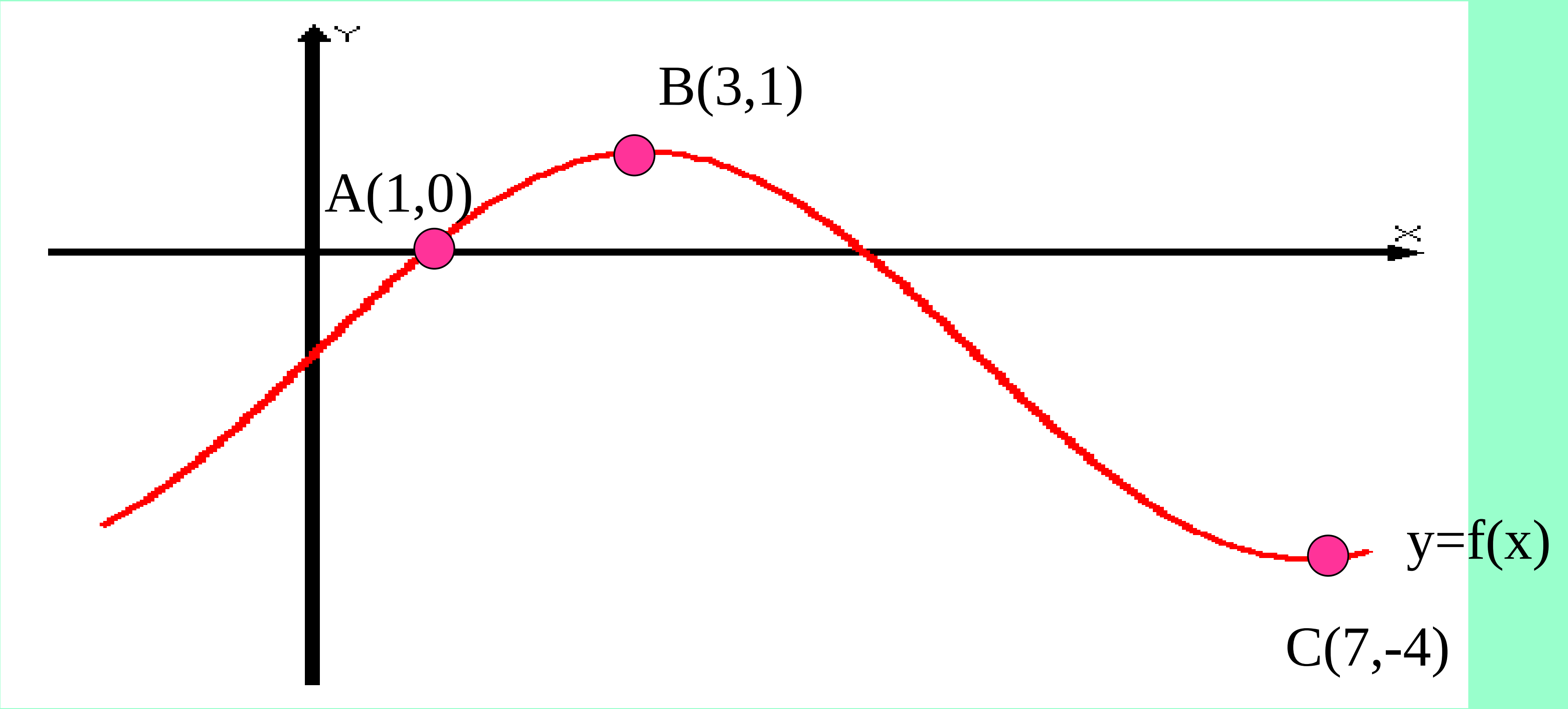
Sketch the graph of 2f(x), clearly annotating the images of A, B and C.



Solution:

As required graph is y = 2f(x) we **multiply** each y-coordinate by 2.

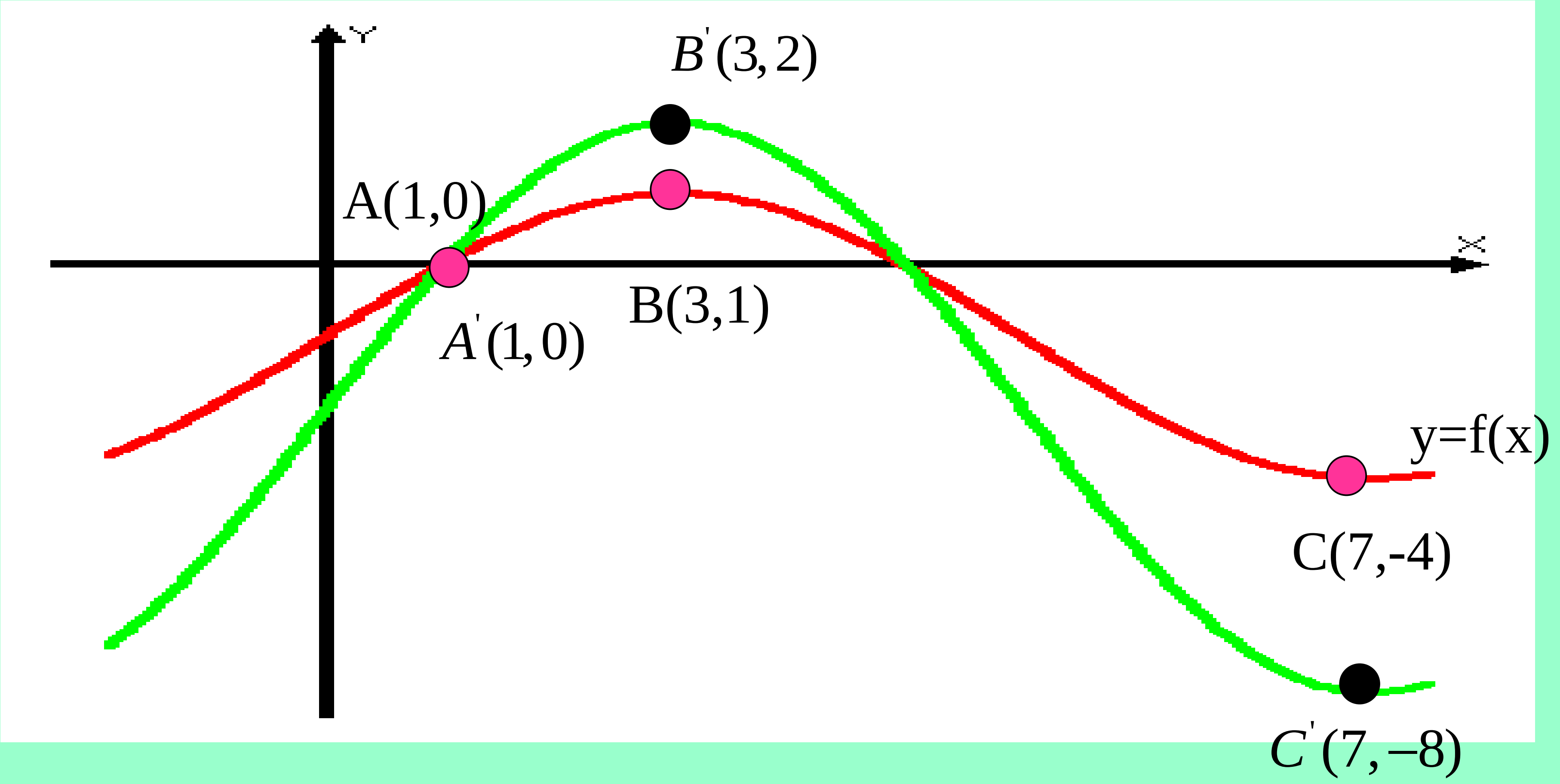
$A(1,0) \rightarrow A'(1,0) \qquad B(3,1) \rightarrow B'(3,2) \qquad C(7,-4) \rightarrow C'(7,-8)$



Solution:

As required graph is y = 2f(x) we **multiply** each y-coordinate by 2.

$A(1,0) \to A^{'}(1,0) \qquad B(3,1) \to B^{'}(3,2) \qquad C(7,-4) \to C^{'}(-7,-8)$



Heinemann, p.43, Ex 3K