Mathematics 11UC

1.6 – Transformations

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transformations

transformations are operations performed on functions to change the position or shape of the associated curves or lines

→ multiplication, addition, subtraction.

quadratic fns

$f(x) = x^2$

transformations

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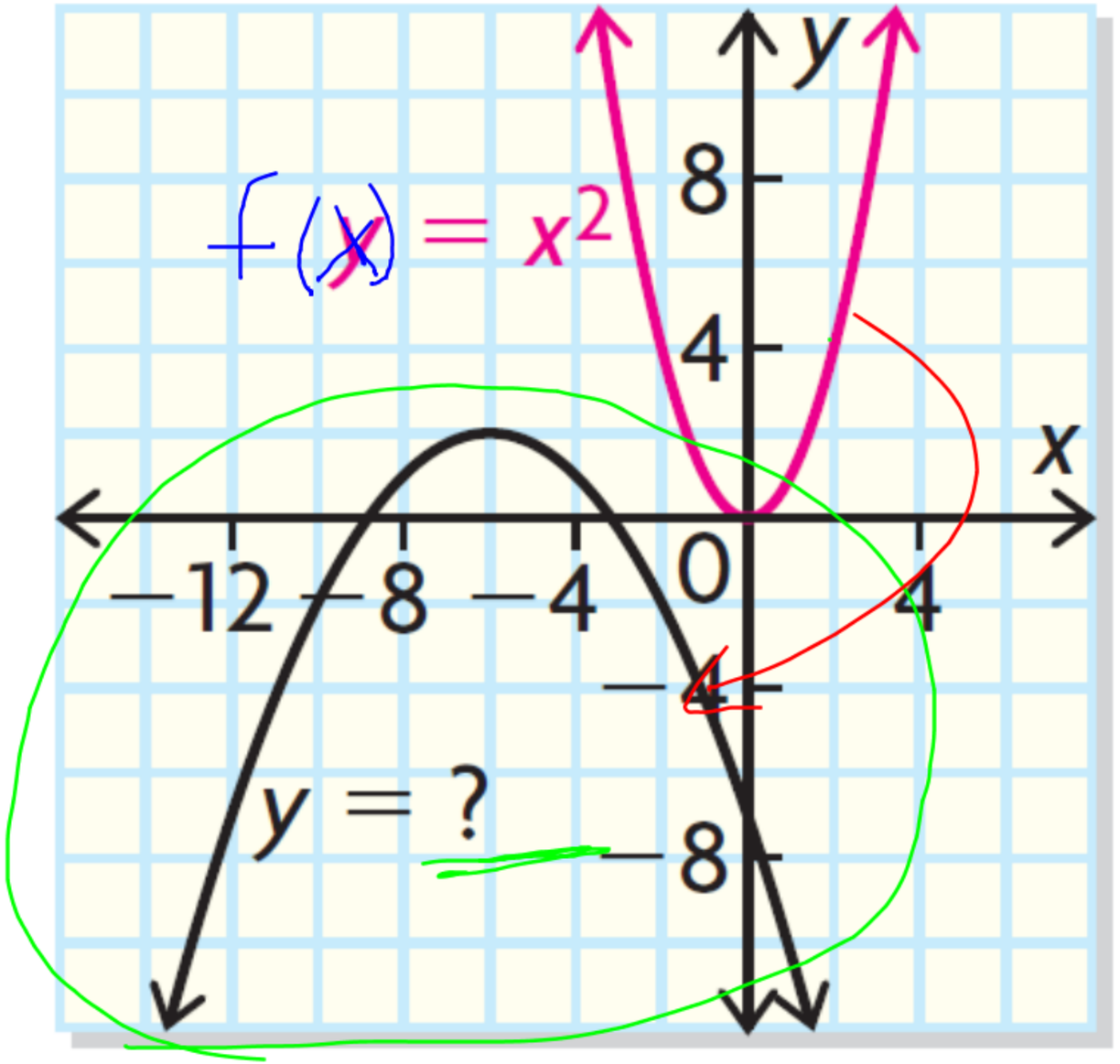
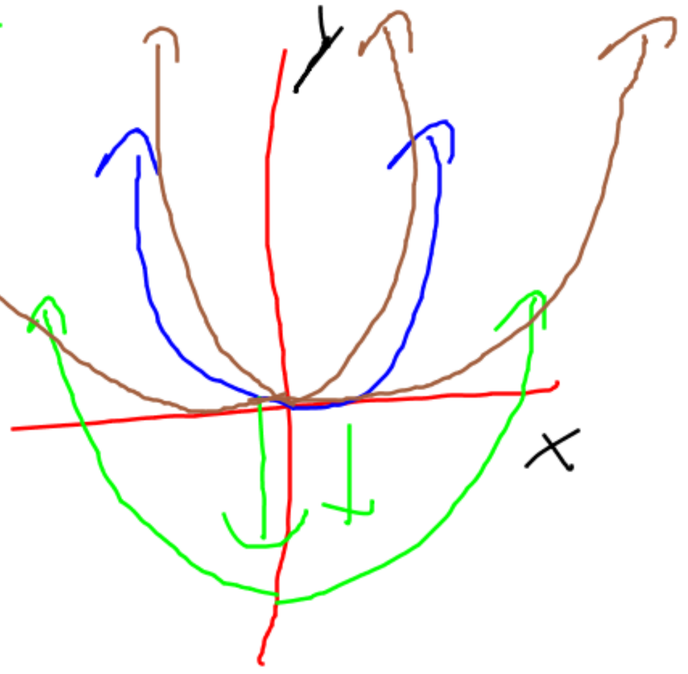


$$f(x) = x^2 \Rightarrow f(x) = a(x-h)^2 + k$$

Horizontal
x

Vertical
y



Stretches ⇒ multiplication
↳ shape changes, position stays.

Shift ⇒ adding subtracting
↳ shape stays, position changes

$$f(x) = a(x-h)^2 + k$$

a: vertical stretch → flip the graph

h: horizontal shift

k: vertical shift

$f(x) = \overset{a}{2}(x - \overset{h}{4})^2 + \overset{k}{3}$

Vertical stretch of 2

Horizontal shift of 4

Vertical shift of 3

$g(x) = -\frac{\overset{a}{2}}{3}(x + \overset{h}{5})^2 - \overset{k}{8}$

$x - (-5)$

V. stretch of $-\frac{2}{3}$

H. shift of -5

V. shift of -8