1.1 + 1.2 Summary – Translations, Reflections + Stretches

- base function: $y = f(x)$
- transformed function:

vertex (h, k)

$$y = a\,f(b(x-h)) + k$$

vertical stretch by a factor of a

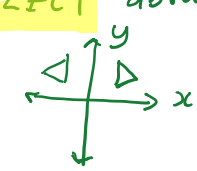
- $(x,y) \to (x, ay)$
  multiply y by a
- If $a < 0$,
  REFLECT about x-axis

horizontal translation

- $(x-h)$: RIGHT
  i.e. h^+
- $(x+h)$: LEFT
  ↳ $x - -h$ i.e., h^-
- $(x,y) \to (x+h, y)$

horizontal stretch by a factor of $\frac{1}{|b|}$

- $(x,y) \to (\frac{1}{b}x, y)$
- If $b < 0$,
  REFLECT about y-axis



vertical translation

k^+: UP

k^-: DOWN

$(x,y) \to (x, y+k)$