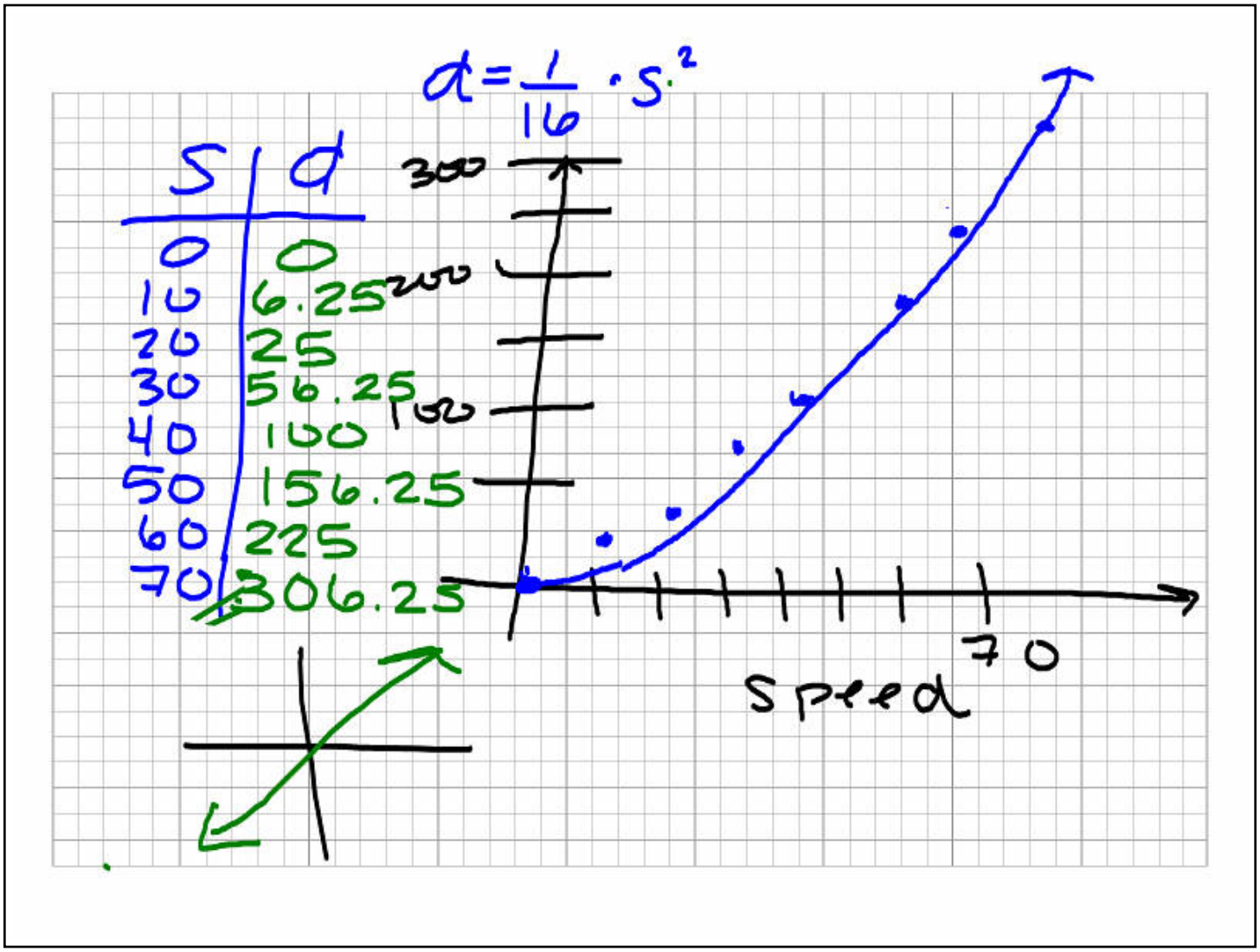
2.5 The Graph of $y = kx^2$

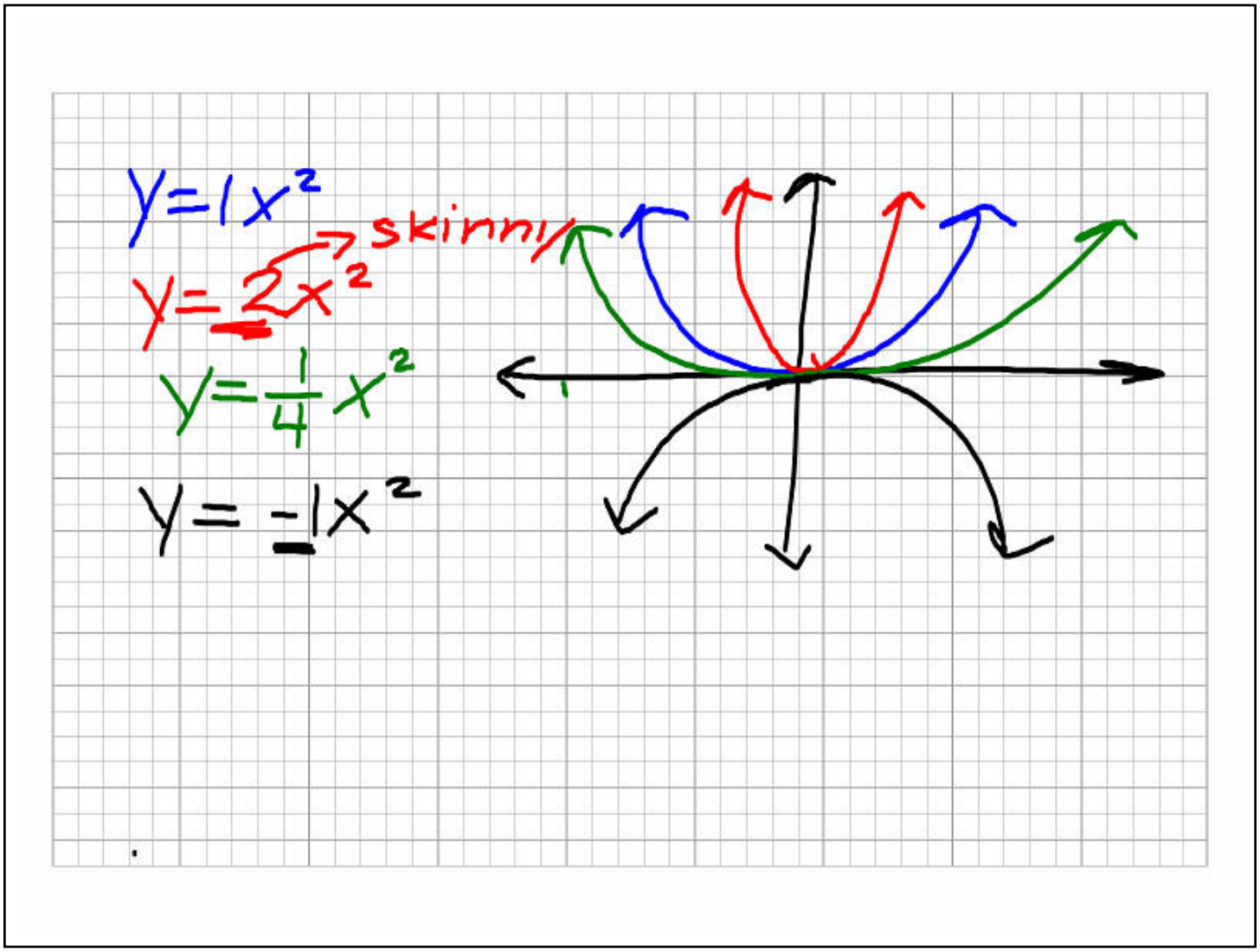
$$d = \frac{1}{16} \cdot s^2$$

distance it takes a car to stop varies directly as the square of it's speed.

2.5 Red


$d = \frac{1}{16} \cdot s^2$
s | d
0 | 0
10 | 6.25
20 | 25
30 | 56.25
40 | 100
50 | 156.25
60 | 225
70 | 306.25
300
200
100
70
Speed

2.5 Red



Properties of $y = kx^2$ $k > 0$ $k < 0$

* creates parabola
* each passes through origin (0, 0)
* each parabola is reflection-symmetric
  → fold parabola in half over y-axis, everything matches up.
  → axis of symmetry

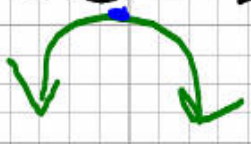
* Domain: $\mathbb{R}$

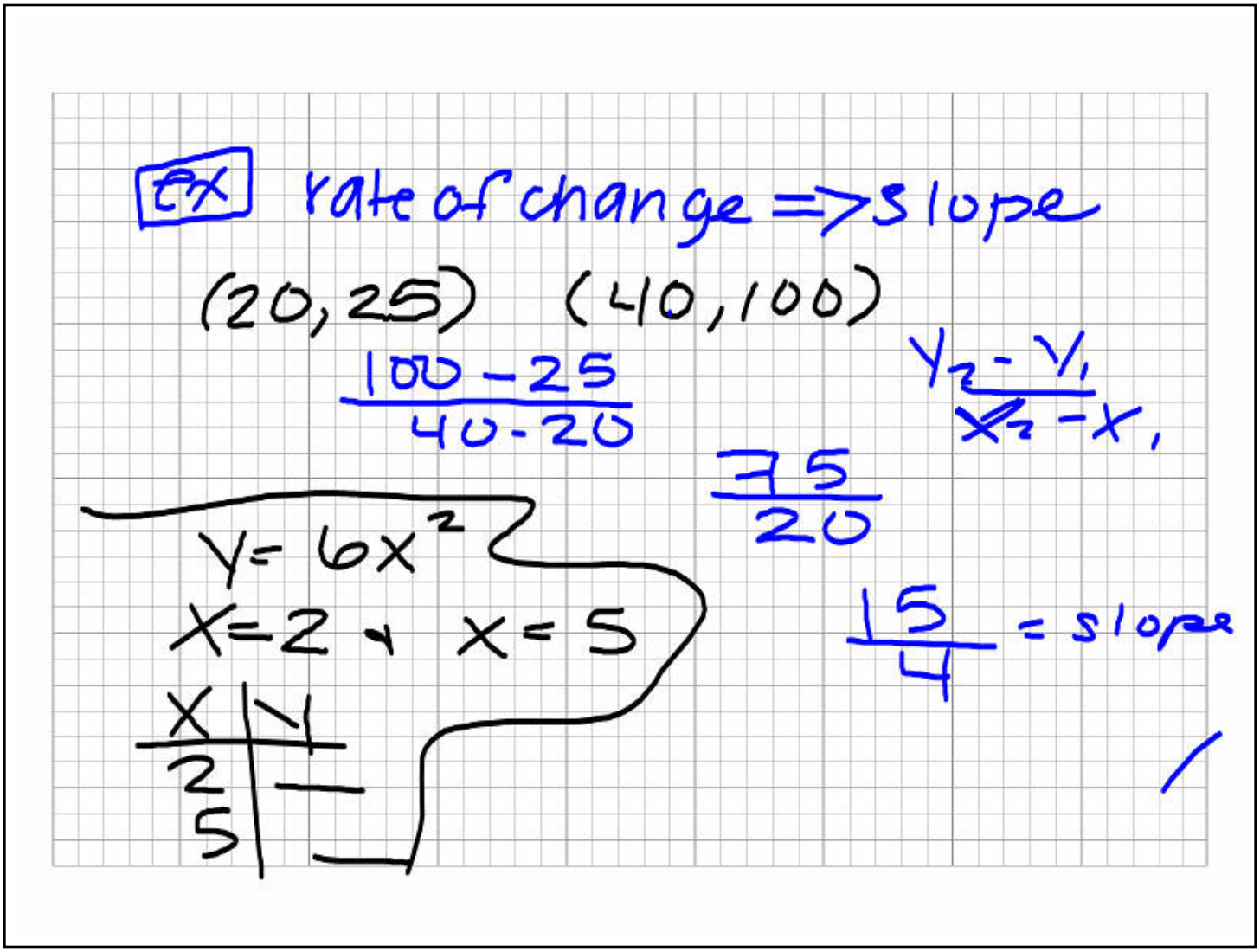
Range: $k > 0 \rightarrow$ pos $\mathbb{R}$, 0

$k < 0 \rightarrow$ neg $\mathbb{R}$, 0

* $k > 0 \Rightarrow$ opens ↑, minimum (Vertex)

* $k < 0 \Rightarrow$ opens ↓, maximum (vertex)




Ex rate of change => slope
(20,25) (40,100)
100 - 25 / 40 - 20
75 / 20
15 / 4 = slope
y2 - y1 / x2 - x1
y = 6x²
x = 2 & x = 5
x | y
2 | —
5 | —