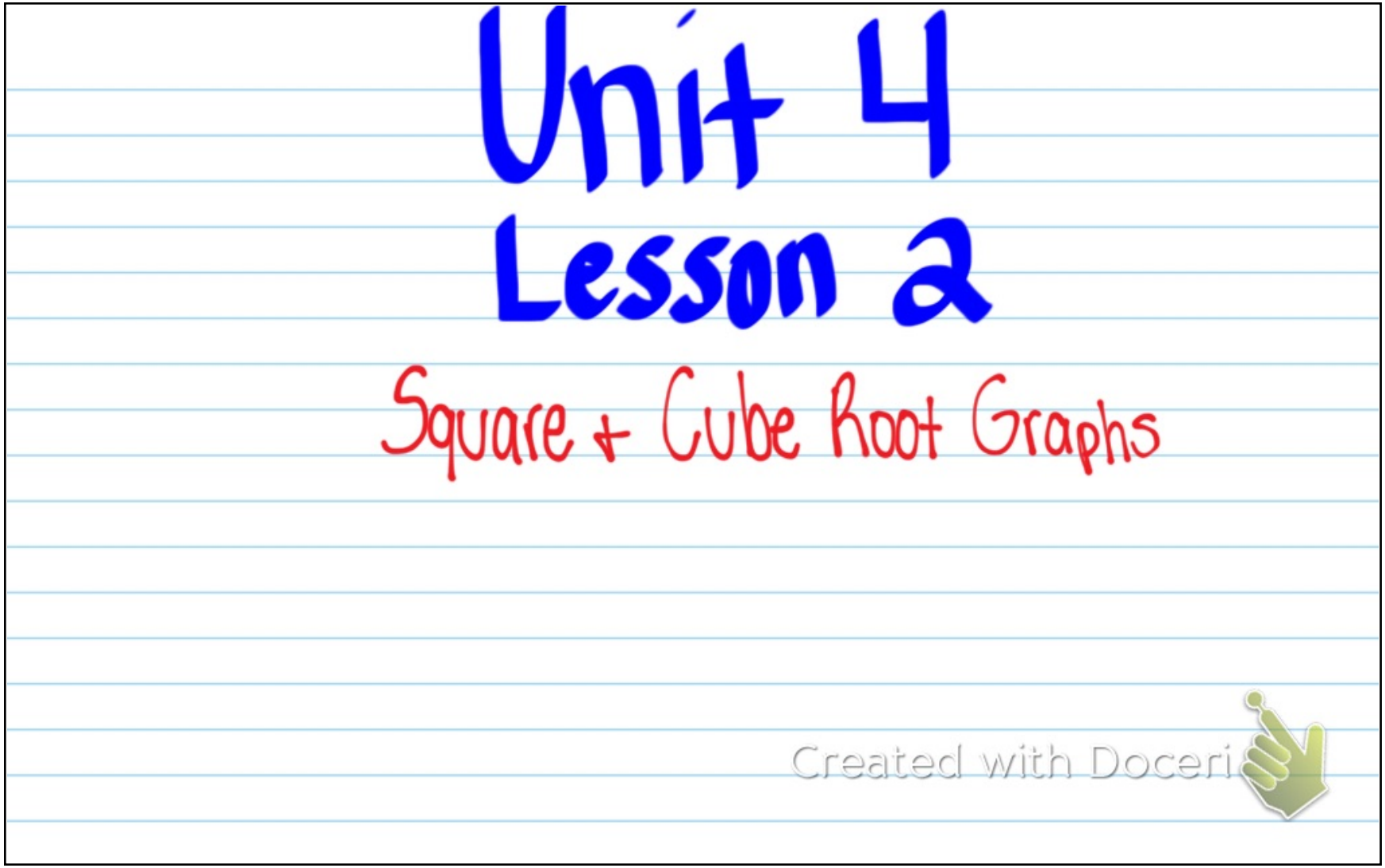
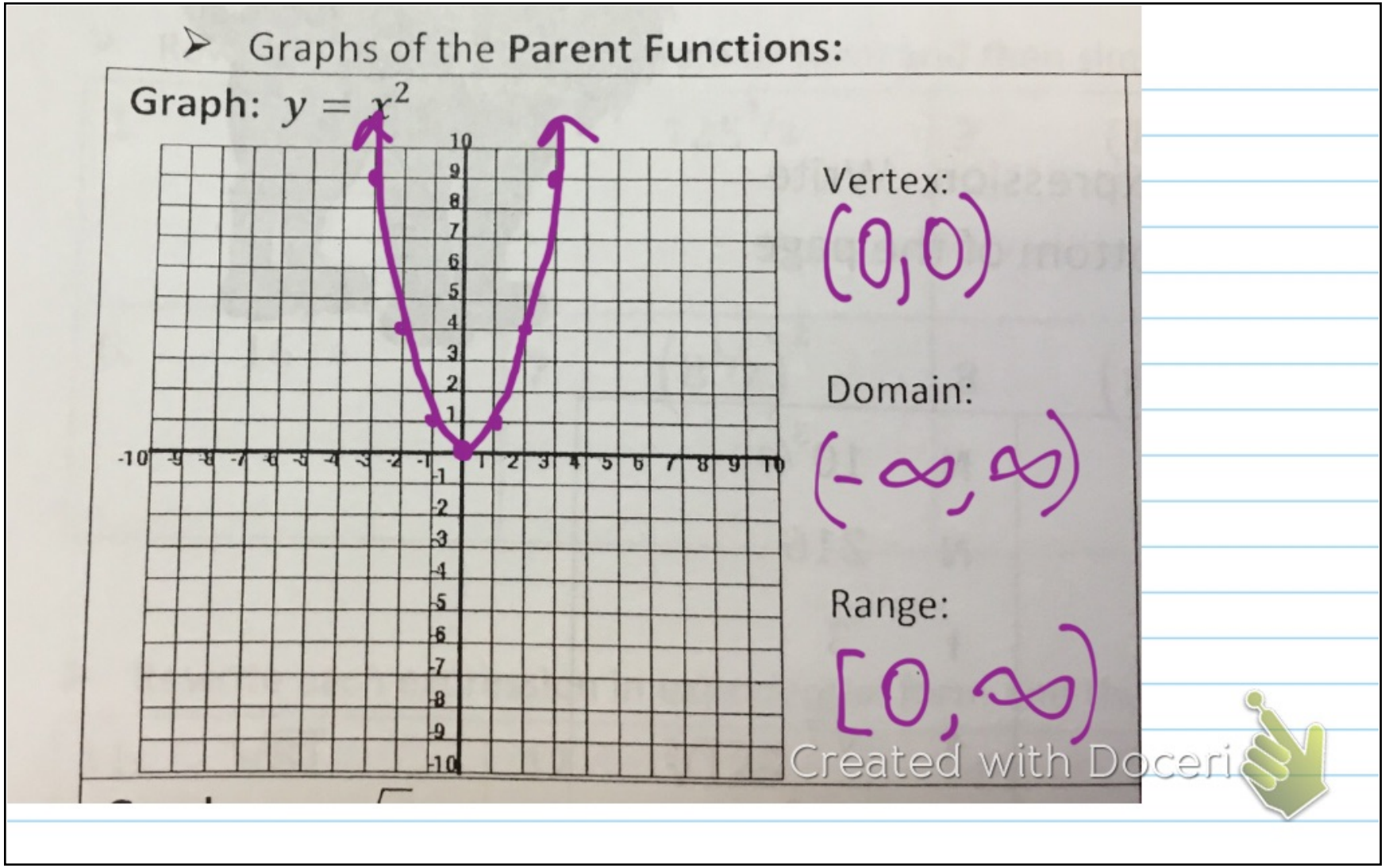
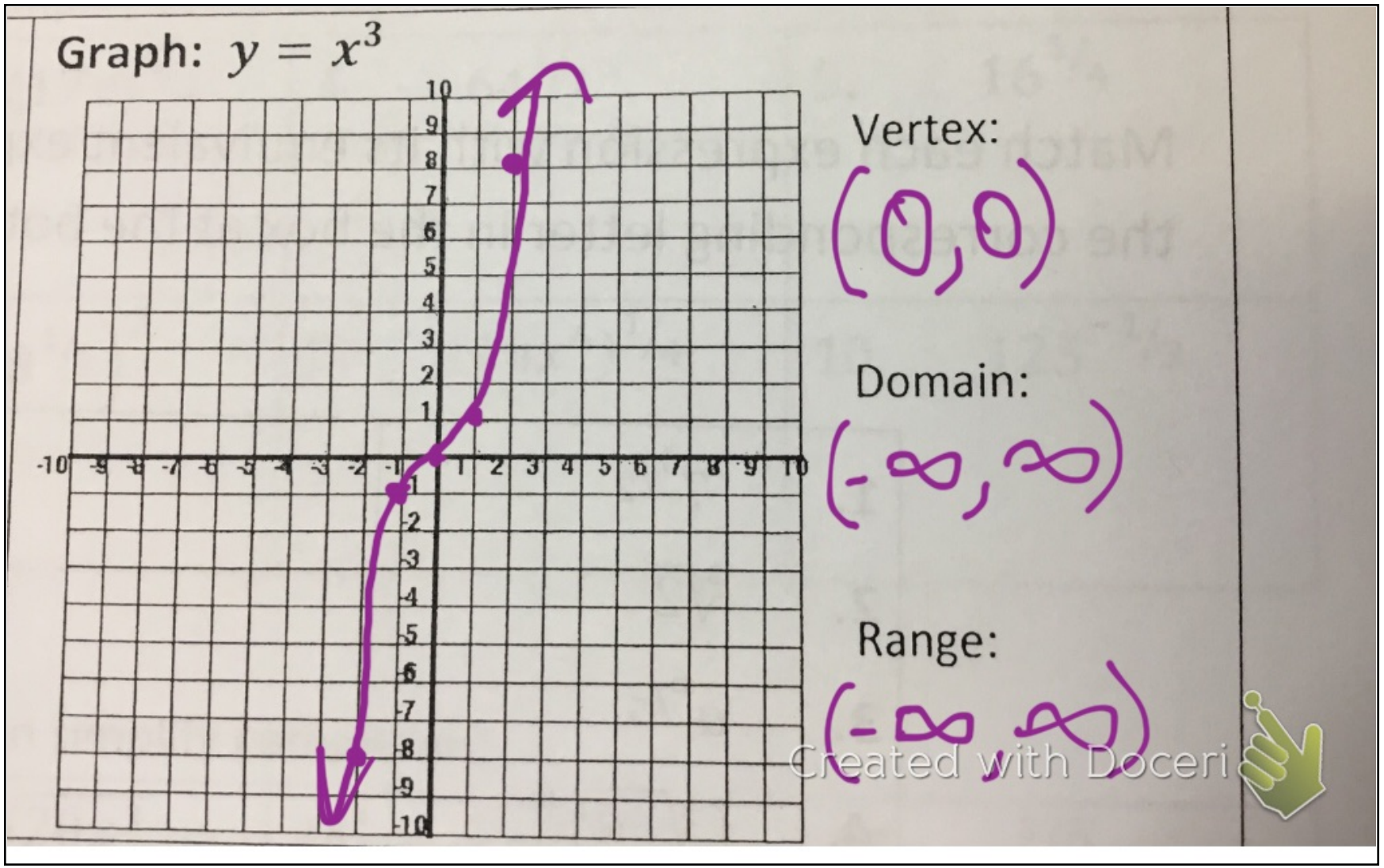
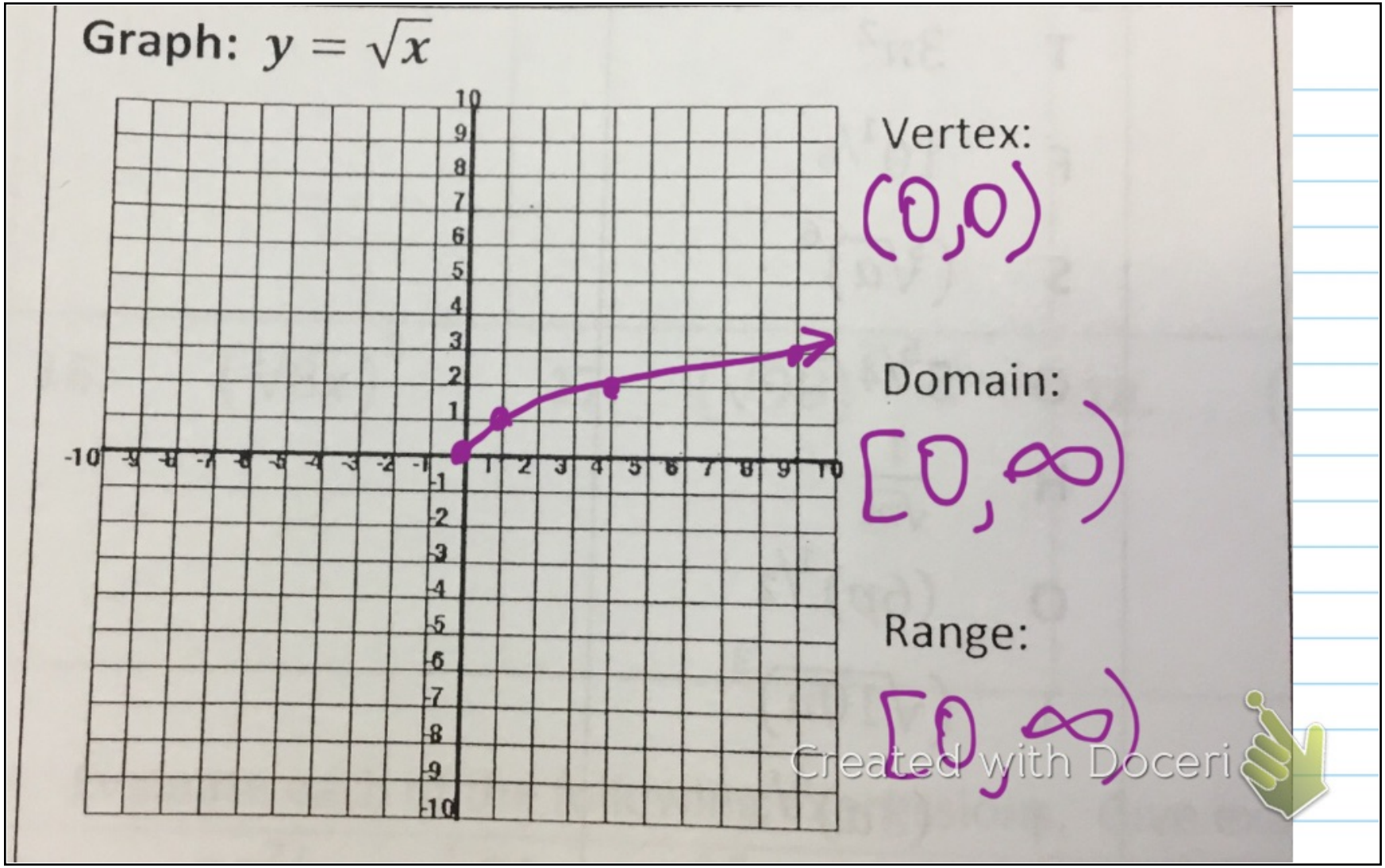
Unit 4
Lesson 2

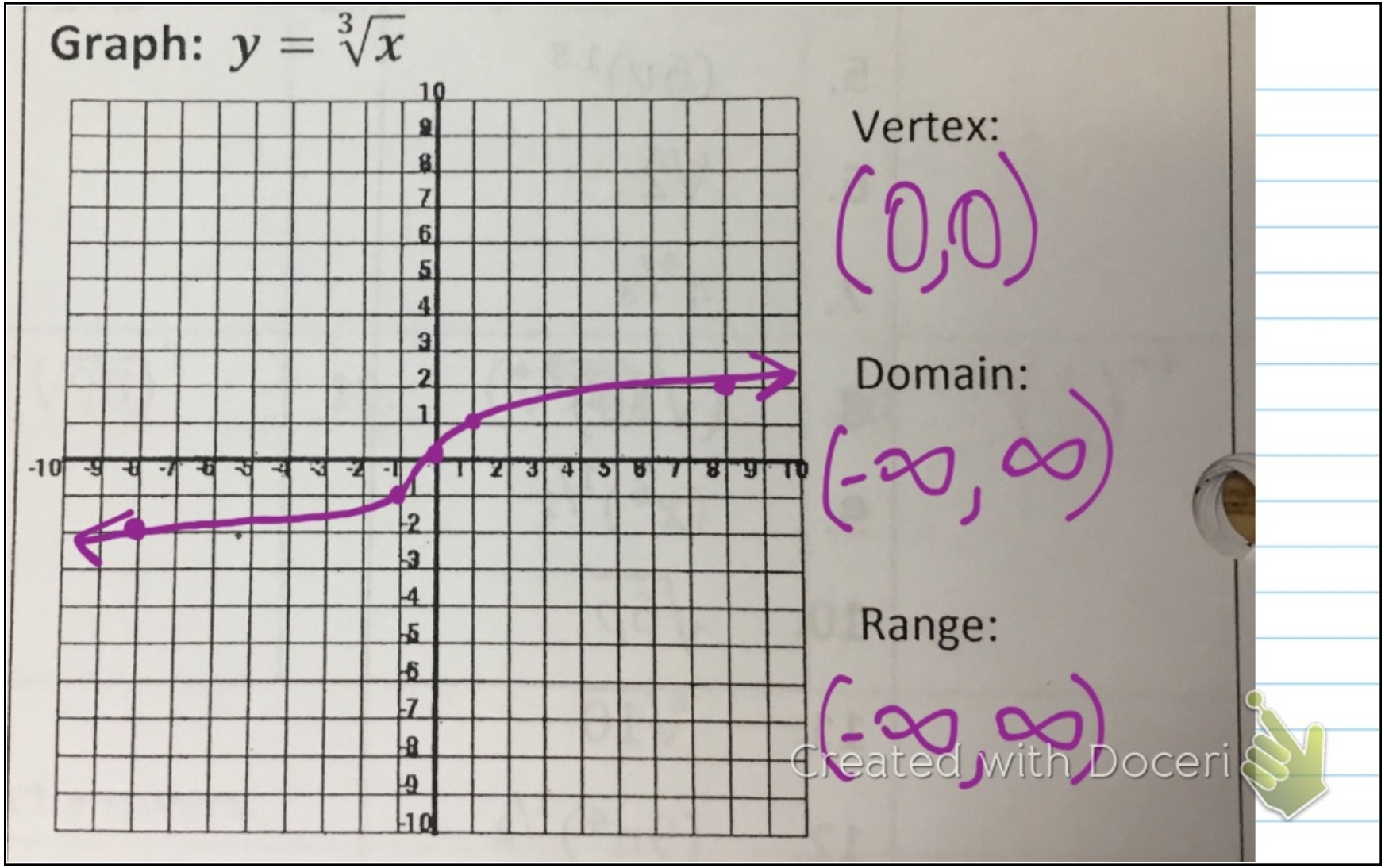
Square + Cube Root Graphs

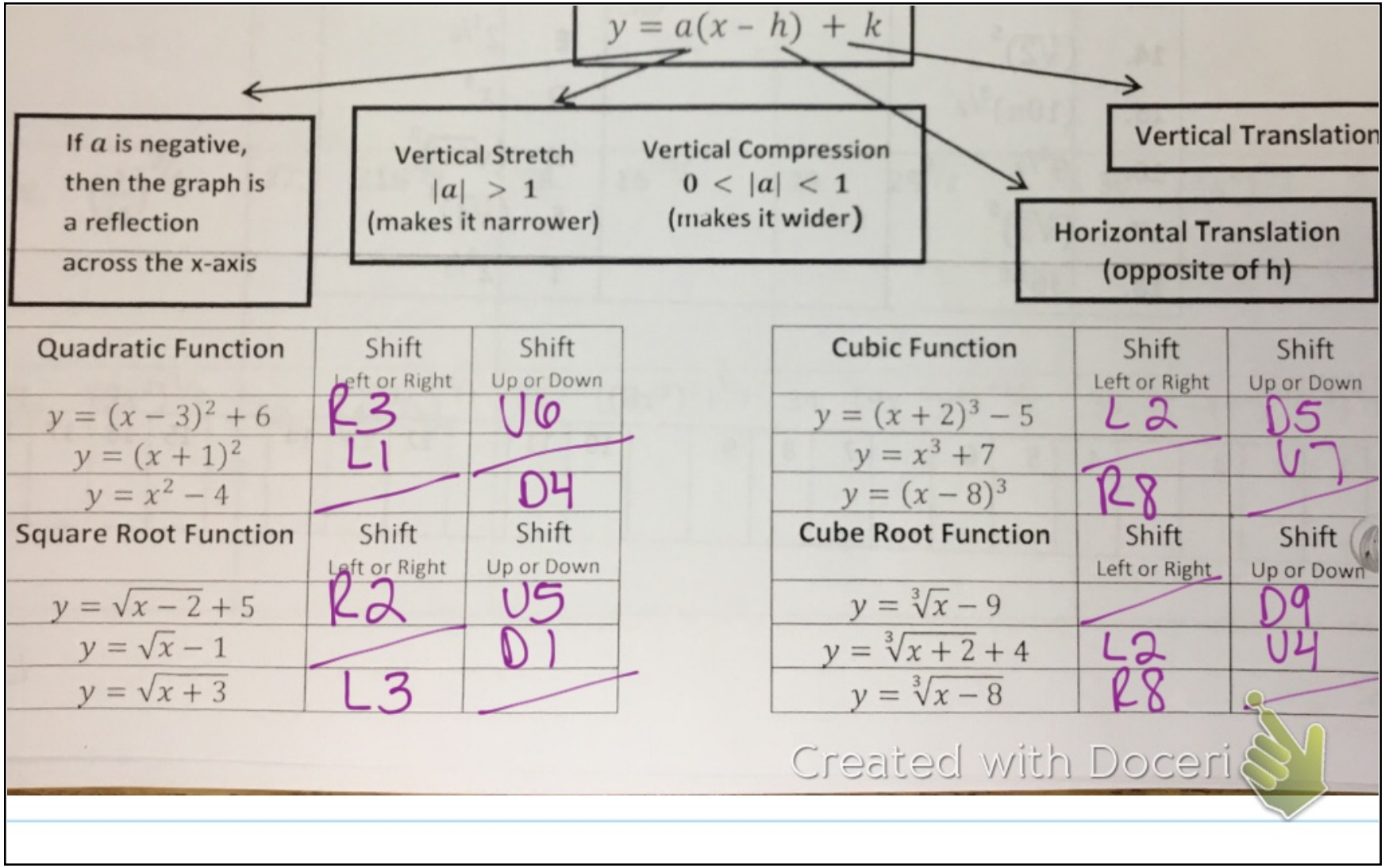



Graphs of the Parent Functions:
Graph: $y = x^2$
Vertex:
(0,0)
Domain:
$(-\infty, \infty)$
Range:
$[0, \infty)$
Created with Doceri


Graph: $y = x^3$
Vertex:
(0,0)
Domain:
$(-\infty, \infty)$
Range:
$(-\infty, \infty)$
Created with Doceri

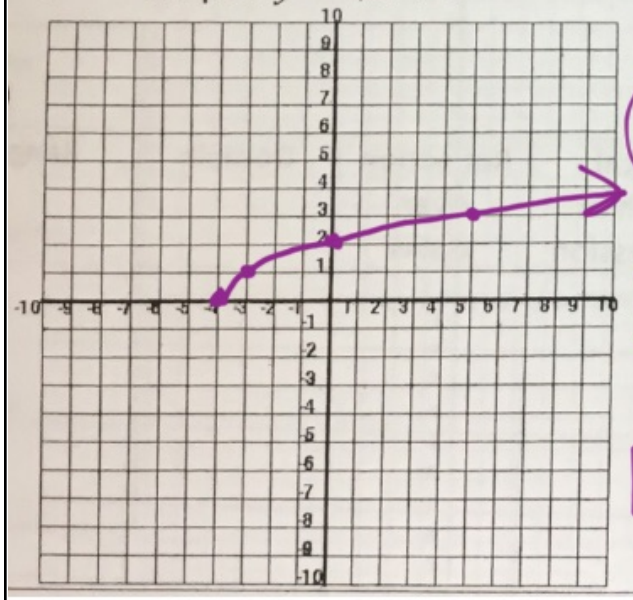

Graph: $y = \sqrt{x}$
Vertex:
(0,0)
Domain:
[0, ∞)
Range:
[0, ∞)
Created with Doceri


Graph: $y = \sqrt[3]{x}$
Vertex:
(0,0)
Domain:
$(-\infty, \infty)$
Range:
$(-\infty, \infty)$
Created with Doceri


$y = a(x - h) + k$
If a is negative, then the graph is a reflection across the x-axis
Vertical Stretch $|a| > 1$ (makes it narrower)
Vertical Compression $0 < |a| < 1$ (makes it wider)
Vertical Translation
Horizontal Translation (opposite of h)
Quadratic Function
Shift Left or Right
Shift Up or Down
$y = (x-3)^2 + 6$ R3 U6
$y = (x+1)^2$ L1
$y = x^2 - 4$ D4
Square Root Function
Shift Left or Right
Shift Up or Down
$y = \sqrt{x-2} + 5$ R2 U5
$y = \sqrt{x} - 1$ D1
$y = \sqrt{x+3}$ L3
Cubic Function
Shift Left or Right
Shift Up or Down
$y = (x+2)^3 - 5$ L2 D5
$y = x^3 + 7$ U7
$y = (x-8)^3$ R8
Cube Root Function
Shift Left or Right
Shift Up or Down
$y = \sqrt[3]{x} - 9$ D9
$y = \sqrt[3]{x+2} + 4$ L2 U4
$y = \sqrt[3]{x-8}$ R8
Created with Doceri

Graph using Transformation Rules:

1. Graph: $y = \sqrt{x+4}$

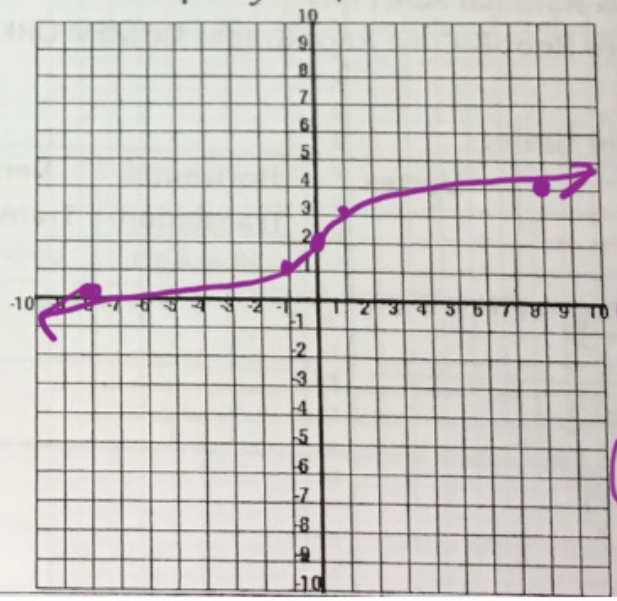


Vertex: (-4,0)

Domain: $[-4, \infty)$

Range: $[0, \infty)$

2. Graph: $y = \sqrt[3]{x} + 2$



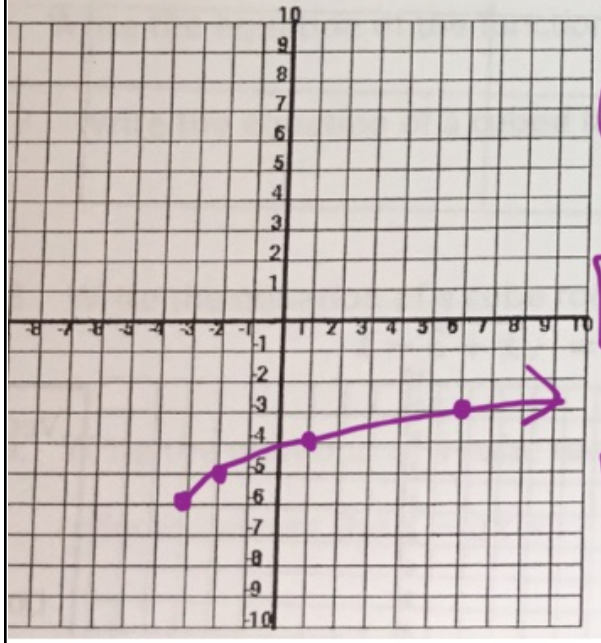
Vertex: (0,2)

Domain: $(-\infty, \infty)$

Range: $(-\infty, \infty)$

Created with Doceri

. Graph: $y = \sqrt{x+3} - 6$

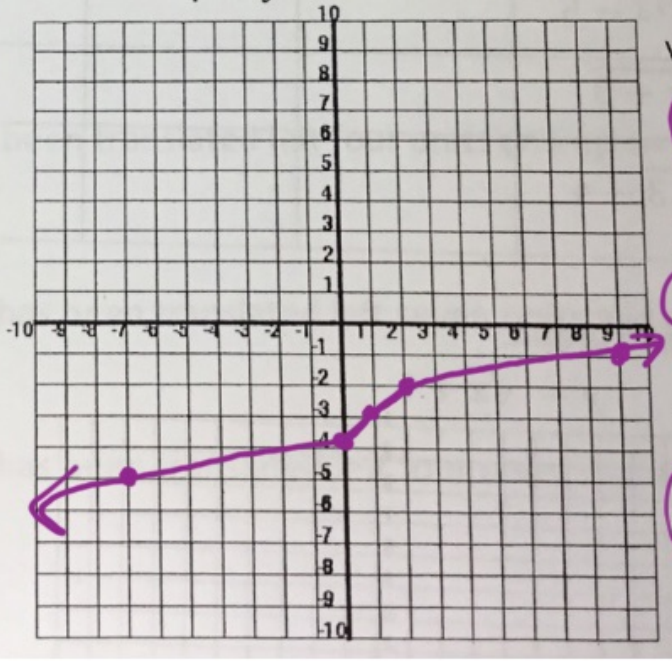


Vertex: $(-3, -6)$

Domain: $[-3, \infty)$

Range: $[-6, \infty)$

4. Graph: $y = \sqrt[3]{x-1} - 3$

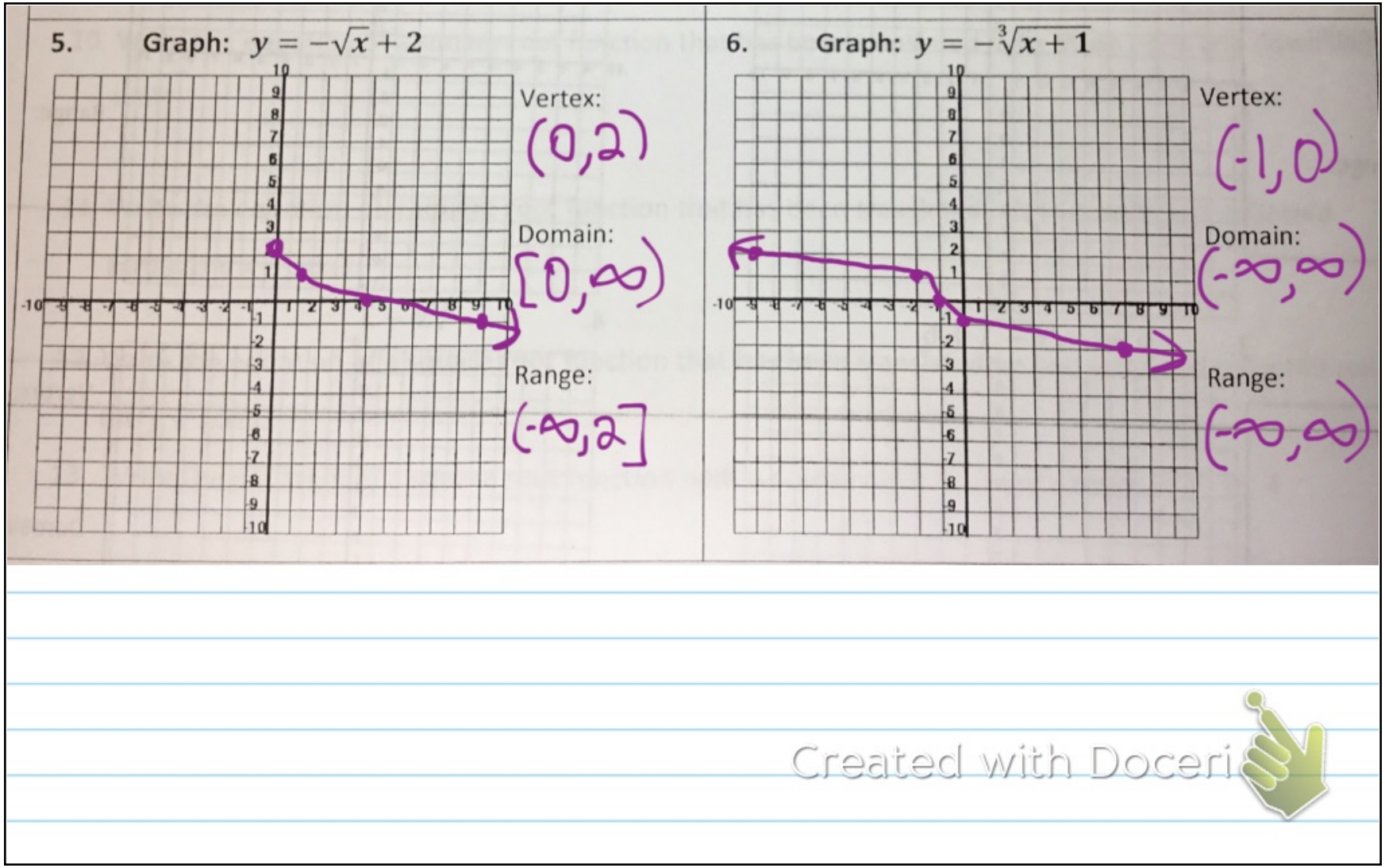


Vertex: $(1, -3)$

Domain: $(-\infty, \infty)$

Range: $(-\infty, \infty)$

Created with Doceri


5. Graph: $y = -\sqrt{x} + 2$
Vertex:
(0,2)
Domain:
[0,∞)
Range:
(-∞,2]
6. Graph: $y = -\sqrt[3]{x+1}$
Vertex:
(-1,0)
Domain:
(-∞,∞)
Range:
(-∞,∞)
Created with Doceri

7. Write the equation of a square root function that has been translated right ten units and up six units.

$y = \sqrt{x-10} + 6$

8. Write the equation of a cube root function that has been translated left three units and down two units.

9. Write the equation of a square root function that has been translated right four units and reflected across the $x - axis$.

10. Write the equation of a square root function with a domain of $x \leq -1$ and a range of $y \geq 2$.

$(-\infty, -1]$ $[2, \infty)$ 6

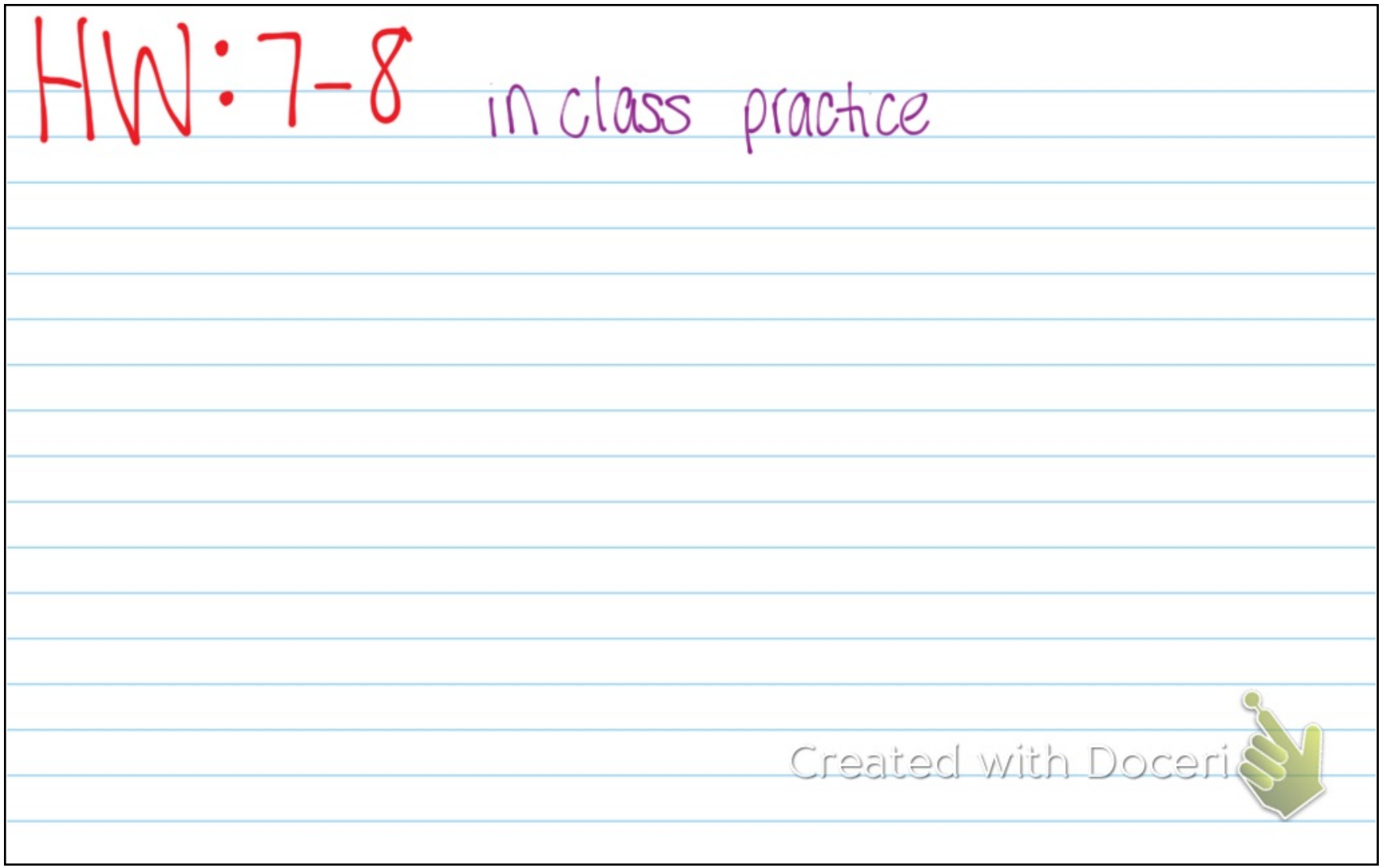
8) $y = \sqrt[3]{x+3} - 2$

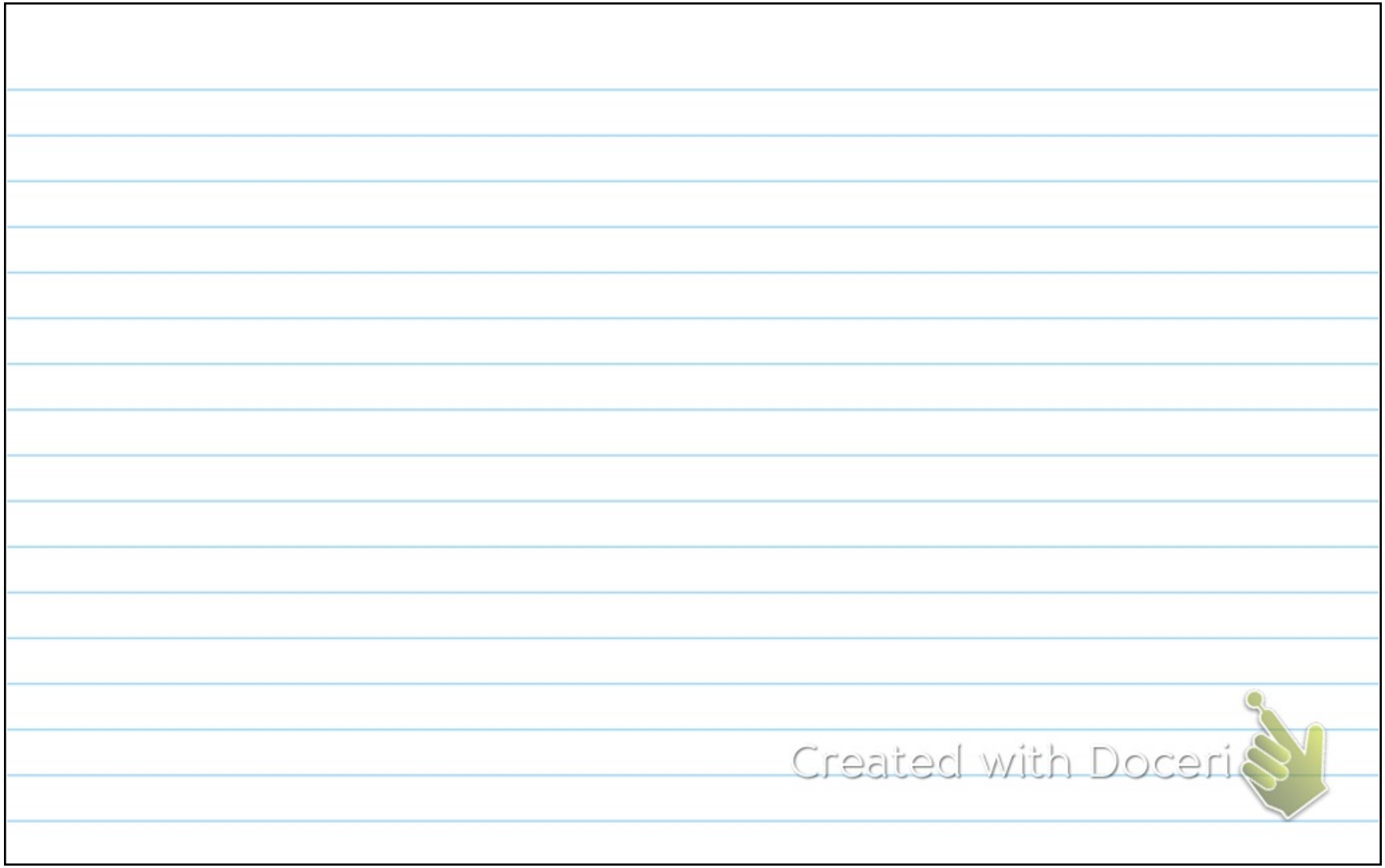
9) $y = -\sqrt{x-4}$

10) $y = \sqrt{-x-1} + 2$

Created with Doceri

HW: 7-8 in class practice




Created with Doceri