Test Review - Radical eq.'s

Quadratic functions (graphing)

vertex

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

a: over 1 left/right from vertex, up 'a'

h: left/right

K: up/down

vertex @ (h, K)

* Need 3 points!!!

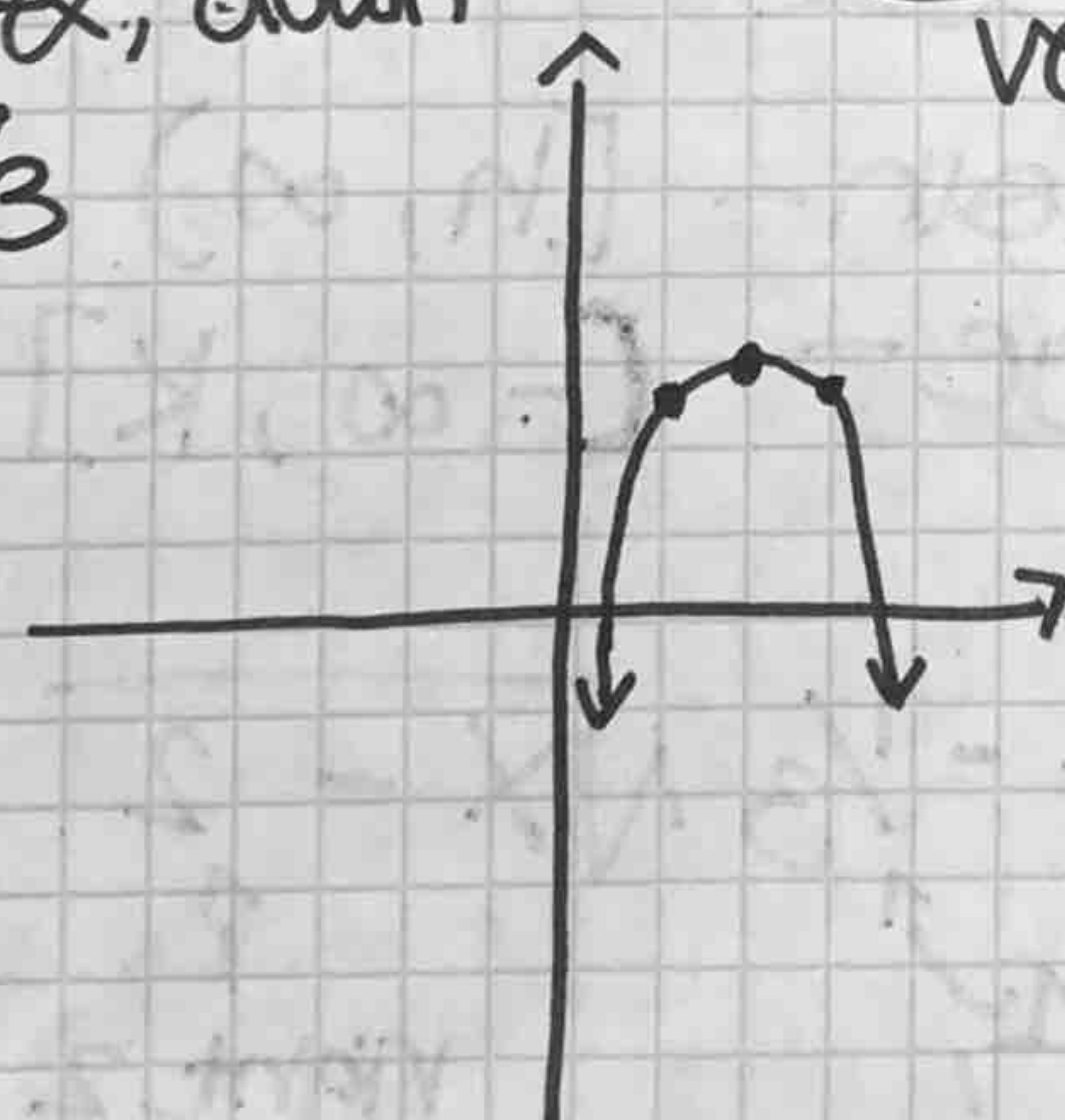
ex) $$f(x) = -\frac{1}{3}(x-2) + 3$$

$-\frac{1}{3}$: over 1 left/right from vertex, down $\frac{1}{3}$

2: right 2

3: up 3

vertex $(2,3)$



ex) $x+1$ by $x+1$: $(x+1)^2$

ex) $x-1$ by $x-1$: $(x-1)^2$

ex) x by x: x^2 x by x: x^2 4 by 2: 8

$$f(x) = 2x^2 + 8$$

ex) x by x, 3 by 2

$$x^2 - 6$$

ex) $x+2$ by $x+2$, 2 by 1

$$(x+2)^2 - 2$$

Square root functions (graphing)

*must have 2 points!

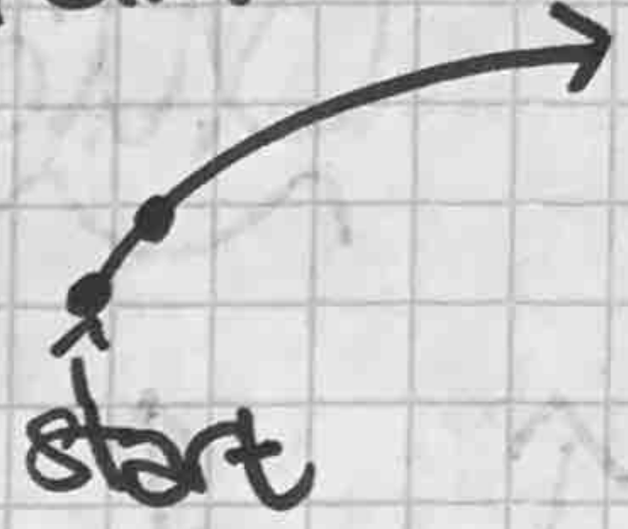
$$f(x) = a\sqrt{x-h} + K$$

a: right 1 from start, up 'a'

h: left/right

K: up/down

start @ (h, K)



* If a is positive
  - domain - $[h, \infty)$
  - range - $[K, \infty)$

* If a is negative - 
  - domain - $[h, \infty)$
  - range - $(-\infty, K]$

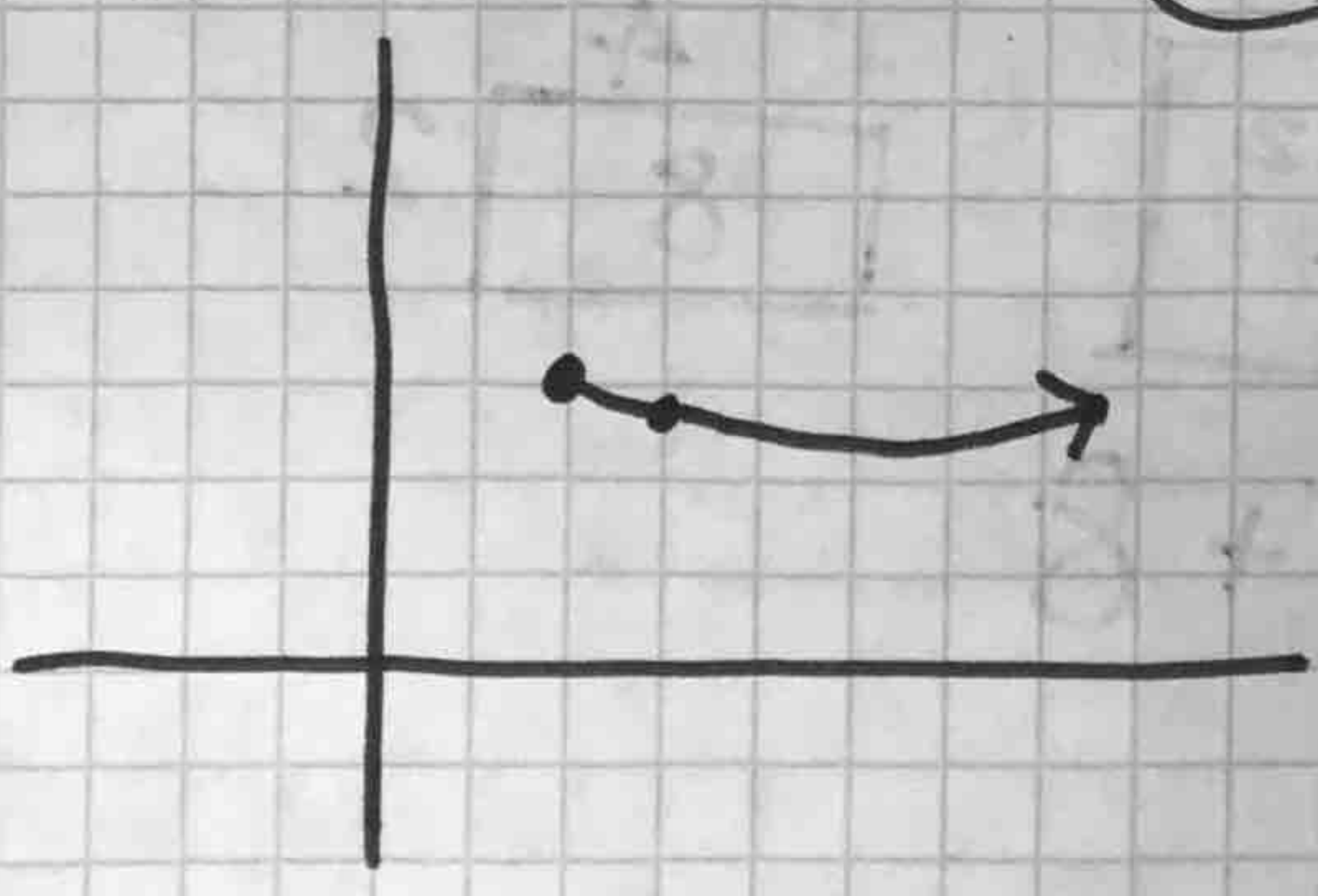
ex) $f(x) = -\frac{1}{3}\sqrt{x-2} + 3$

$-\frac{1}{3}$: right 1, down $\frac{1}{3}$

2: right 2

3: up 3

start @ $(2,3)$



domain - $[2, \infty)$

range - $(-\infty, 3]$

Radical Equations -

*Just like in algebra 1, inverse operations:

$+ \longleftrightarrow -$

$\times \longleftrightarrow \div$

$\sqrt{\ } \longleftrightarrow (\ )^2$ ← to undo $\sqrt{\ }$, must square both sides.

* must have $\sqrt{\ }$ completely by itself before squaring both sides!
  - work backwards from PEMDAS.

ex)

$$3\sqrt{x+13} + 2 = 8$$
$$-2 \quad -2 \quad \leftarrow \text{undo } +/-$$

$$\frac{3\sqrt{x+13}}{3} = \frac{6}{3} \quad \leftarrow \text{undo } \div/\times$$

$$\left(\sqrt{x+13}\right)^2 = (2)^2 \quad \leftarrow (\ )^2 \text{ both sides}$$

$$x+13 = 4$$
$$-13 \quad -13$$
$$x = -9 \quad \leftarrow$$

✓ can have x be negative!!!

ex)

$$\frac{-3\sqrt{x+1}}{-3} = \frac{12}{-3}$$

$$\sqrt{x+1} = -4 \leftarrow$$

Impossible to have $\sqrt{\ }$ equal a negative #!!!

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If you end up with a quadractic equation: $ax^2+bx+c=0$

1) must set $=0$

2) solve by:

- factoring, setting each factor pair equal to 0 and solving
- completing the square
- Quadratic formula

$$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$$

3) Check answers!

*because it's impossible to have a $\sqrt{\ }$ equal a negative #!

ex) $-3+\sqrt{12x+4}=x$ ← get $\sqrt{\ }$ by itself!

$\quad +3 \qquad\qquad +3$

* $\left(\sqrt{12x+4}\right)^2=(x+3)^2$ ← $()^2$ both sides

$12x+4=x^2+6x+9$

$-12x\ -4 \qquad -12x\ -4$

	x	$+3$
x	x^2	$3x$
$+3$	$3x$	9

$0=x^2-6x+5$ ← set equal to 0!

$-1+-5 \qquad -1\cdot-5$

$0=(x-1)(x-5)$

$x-1=0$
$x=1$

$x-5=0$
$x=5$

* <u>Chuck:</u> use the equation where the $\sqrt{}$ is isolated to see if it'll be equal to a negative!

* $\sqrt{12x+4} = x+3$

$x = 1$

positive

$\sqrt{12(1)+4} = 1+3$ ✓

$x = 5$

positive

$\sqrt{12(5)+4} = 5+3$ ✓