

ROOTS

index \rightarrow $\sqrt[2]{121}$ radicand

$$\sqrt{25} = 5$$

$$\sqrt[3]{-8} = -2 \quad -2 \cdot -2 \cdot -2$$

$$\sqrt{-49} = 7i$$

$$\sqrt[4]{-81} = \text{not possible}$$

$$\sqrt[10]{-5368} = \text{not possible}$$

$$\sqrt{24} = \sqrt{4 \cdot 6} = 2\sqrt{6}$$

$$\sqrt[3]{40} = \sqrt[3]{8 \cdot 5} = 2\sqrt[3]{5}$$

$$\sqrt[4]{162} = \sqrt[4]{81 \cdot 2} = 3\sqrt[4]{2}$$

$$\sqrt[6]{3645} = \sqrt[6]{729 \cdot 5} = 3\sqrt[6]{5}$$

x^3
1
8
27

x^4
1
16
81
256

x^6
1
64
729

$$\sqrt{a^2} = |a|$$

$$\sqrt{a^4} = a^2$$

$$\sqrt{y^6} = |y^3|$$

$$y^3 \cdot y^3$$

$$\sqrt[5]{z^{20}} = z^4$$

Add abs value when = Even Index — Even power Inside root — Odd power outside root

$$\sqrt[4]{a^8 b^{28} c^{100}} = a^2 |b^7 c^{25}|$$

Annotations: 'even' under 8, 'even' under 28, 'odd' under 100, '2' under a, '7' under b, '25' under c.

$$\sqrt[6]{a^{36} b^{42} c^{92}} = a^6 |b^7 c^{15}| \sqrt{c^2}$$

Annotations: 'even' under 36, 'even' under 42, 'odd' under 92, '6' under a, '7' under b, '15' under c, '2' under c.

$$\sqrt{x^7} = \sqrt{x^6} \cdot \sqrt{x} = x^3 \sqrt{x}$$

Annotations: '3' under x^6, '2' under x^7, '3' under x^3, '2' under x^7.

$$\sqrt[3]{x^7 y^{11}} = x^2 y \sqrt[3]{x y^2}$$

$$\sqrt{x^2 + 8x + 16} = \sqrt{(x+4)(x+4)}$$

$$= \sqrt{(x+4)^2}$$

$$= |x+4|$$

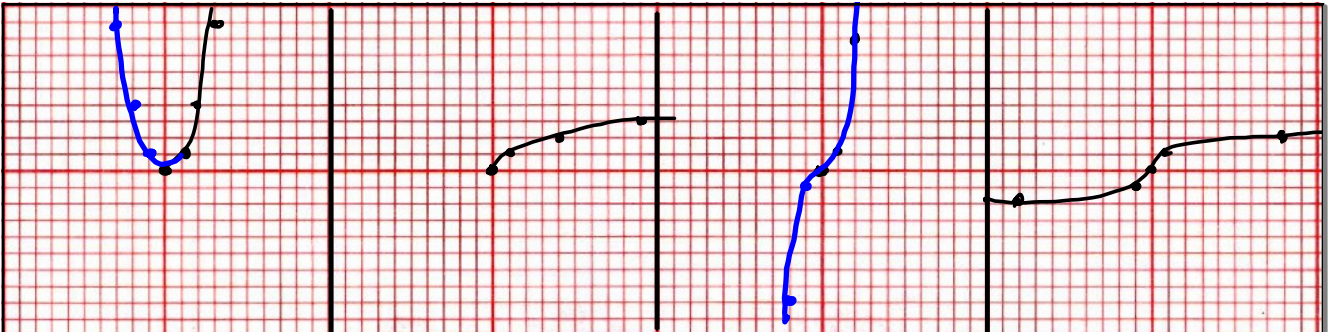
Annotations: 'even' under (x+4)^2, 'even' under (x+4), 'odd' under |x+4|.

$$\sqrt[4]{x^6 y^6} \cdot \sqrt[4]{x^3 y^7} = \sqrt[4]{x^9 y^{13}}$$

$$= x^2 y^3 \sqrt[4]{x y^1}$$

Annotations: 'even' under x^6, 'even' under y^6, 'not even' under x^3, 'even' under y^7, '2' under x^2, '3' under y^3, '1' under x, '1' under y.

$$\sqrt{2} \cdot \sqrt{3} = \sqrt{6}$$



$$y = x^2$$

1	0
-2	-0
3	9

$$y = \sqrt{x}$$

0	0
4	2
9	3

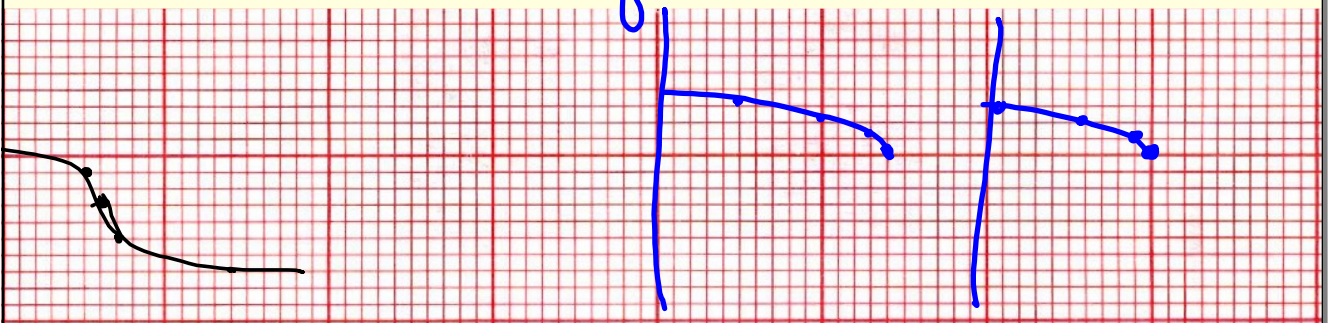
$$y = x^3$$

0	0
-2	-8
1	1
8	8

$$y = \sqrt[3]{x}$$

0	0
-8	-2
1	1
8	2

Sgarabola



$$y = -2\sqrt[3]{x+4} - 3$$

↗ left 4
 ↗ Down 3

0	0	0
-1	-2	-2
8	2	-4

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

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

Right 4

0	0
-4	2
-9	3

$$y = \sqrt{-x}$$

0	0
-1	1
-4	2
-9	3

