

Radical Equations and graphs Review

Simplify.

1. $20^{\frac{1}{2}} \cdot 20^{\frac{1}{2}}$ $\sqrt{20} \cdot \sqrt{20} = 20$

2. $3^{\frac{1}{3}} \cdot 9^{\frac{1}{3}}$ $\sqrt[3]{3} \cdot \sqrt[3]{9} = \sqrt[3]{27} = 3$

3. Write the exponential expression $3x^{\frac{3}{8}}$ in radical form. $3\sqrt[8]{x^3}$

4. Write $(8a^{-3})^{-\frac{2}{3}}$ in simplest form.

$$8^{-\frac{2}{3}} a^2 = \frac{a^2}{8^{2/3}} = \frac{a^2}{(\sqrt[3]{8})^2} = \frac{a^2}{(2)^2} = \frac{a^2}{4}$$

What is the solution of the equation?

5. $\sqrt{x+10} - 7 = -5$

$$\sqrt{x+10} = 2$$

$$x+10 = 4$$

$$x = -6$$

6. $\sqrt{2x+8} - 6 = -4$

$$\sqrt{2x+8} = 2$$

$$2x+8 = 4$$

$$2x = -4$$

$$x = -2$$

7. $-10 + \sqrt{x+8} = -4$

$$\sqrt{x+8} = 6$$

$$x+8 = 36$$

$$x = 28$$

8. $(x+6)^{\frac{3}{5}} = 8$

$$x+6 = 8^{\frac{5}{3}}$$

$$x+6 = (\sqrt[3]{8})^5$$

$$x+6 = (2)^5$$

$$x+6 = 32$$

$$x = 26$$

What is the solution of the equation? Eliminate any extraneous solutions.

$$9. (-2x + 6)^{\frac{1}{5}} = (-8 + 10x)^{\frac{1}{5}}$$

$$\begin{array}{r} -2x + 6 = -8 + 10x \\ -10x \quad -6 \end{array}$$

$$\begin{array}{r} -12x = -14 \\ \hline -12 \quad -12 \end{array}$$

$$x = \frac{7}{6}$$

$$10. (5x)^2 = (\sqrt{10 + 15x})^2$$

$$25x^2 = 10 + 15x$$

$$25x^2 - 15x - 10 = 0$$

$$5(5x^2 - 3x - 2) = 0 \quad \begin{array}{r} -10 \mid -3 \\ \hline 2(5) \mid \frac{2}{5} \frac{5}{5} \end{array}$$

$$5(x + \frac{2}{5})(x - 1) = 0$$

$$\cancel{x = -\frac{2}{5}} \quad \textcircled{x = 1}$$

$$\begin{array}{l} 5x \\ 5(-\frac{2}{5}) = -2 \quad 5(1) = 5 \end{array}$$

$$11) \sqrt{3x+28} - 8 = x$$

$$\sqrt{3x+28} = (x+8)^2 \rightarrow$$

$$\sqrt{3x+28} = x+8$$

$$\cancel{3x+28} = x^2 + 16x + 64$$

$$-3x - 28$$

$$\begin{array}{l} -9+8 \\ = -1 \end{array} \quad \begin{array}{l} -4+8 \\ = 4 \end{array}$$

$$\begin{array}{r} 36 \overline{) 13} \\ 6(6) \\ \hline 4(9) \\ \hline \end{array}$$

$$0 = x^2 + 13x + 36$$

$$0 = (x+4)(x+9)$$

$$x = -4 \quad x = -9$$

Graph the equation.

12. $y = \sqrt{x} + 1$

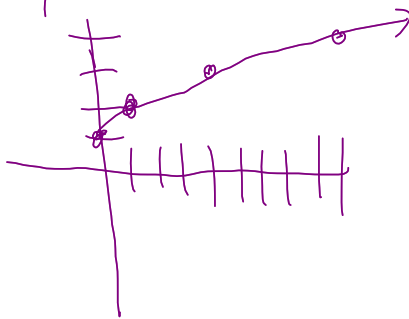
x	0	1	4	9
y	1	2	3	4

$\sqrt{4} + 1 = 3$

$\sqrt{0} + 1 = 1$

$\sqrt{1} + 1 = 2$

$\sqrt{9} + 1 = 4$



13. $y = \sqrt{x+3}$

x	-3	-2	1	6
y	0	1	2	3

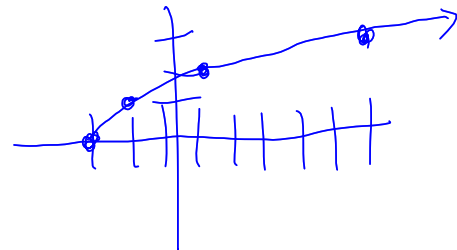
$x+3=4$
 $x=1$

$\sqrt{4}=2$

$\sqrt{9}=3$

$x+3=9$
 $x=6$

$\sqrt{9}=3$



$x+3=0$

$x=-3$

$\sqrt{0}=0$

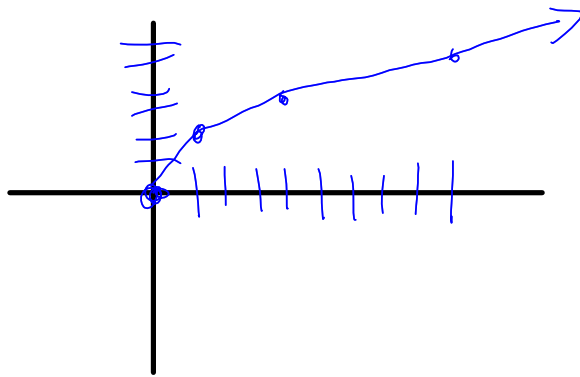
$x+3=1$

$x=-2$

$\sqrt{1}=1$

$$14 = y = 2\sqrt{x}$$

x	0	1	4	9
y	0	2	4	6



15. $y = \sqrt[3]{x-1} + 1$

$x-1 = -8$

$x = -7$

$x-1 = -1$

$x = 0$

$x-1 = 0$

$x = 1$

$x-1 = 1$

$x = 2$

$x-1 = 8$

$x = 9$

x	-7	0	1	2	9
y	-1	0	1	2	3

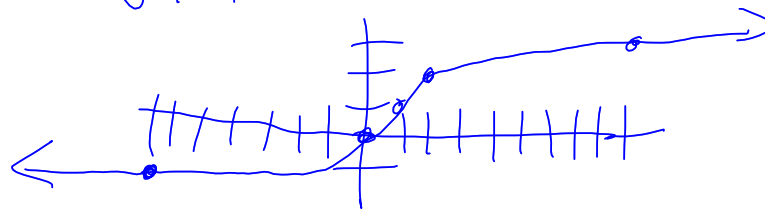
$\sqrt[3]{-8} + 1 = -2 + 1 = -1$

$\sqrt[3]{-1} + 1 = -1 + 1 = 0$

$\sqrt[3]{0} + 1 = 1$

$\sqrt[3]{8} + 1 = 2 + 1 = 3$

$\sqrt[3]{1} + 1 = 1 + 1 = 2$



16. Rewrite $y = \sqrt{9x - 36} - 4$ to make it easy to graph using a translation. Describe the graph.

$$y = \sqrt{9(x-4)} - 4$$
$$y = 3\sqrt{x-4} - 4$$

down 4 units
right 4 units