

Standard 3 Review:

Name: _____

1. Rewrite the following Radicals with Rational Exponents.

a. $\sqrt[4]{x}$ $x^{1/4}$

b. $\sqrt[3]{(3x-2)^5}$ $(3x-2)^{5/3}$

2. Rewrite the following in Radical Notation.

a. $x^{\frac{1}{2}}$ \sqrt{x}

b. $(4-5x)^{\frac{2}{7}}$ $\sqrt[7]{(4-5x)^2}$ or $(\sqrt[7]{4x-5})^2$

3. Simplify.

a. $\sqrt{324}$ 18

b. $\sqrt[3]{-64}$ -4

c. $\sqrt{8}$ $2\sqrt{2}$

d. $(-32)^{\frac{1}{5}}$ -2

e. $27^{\frac{4}{3}}$ 481

f. $-125^{-\frac{2}{3}}$ $-\frac{1}{25}$

4. Simplify.

a. $3\sqrt{7} - 2\sqrt{7}$ $\sqrt{7}$

b. $\sqrt[3]{2} - \sqrt[4]{3}$ already simplified

c. $\sqrt{3} \bullet \sqrt{27}$ 9

d. $\frac{\sqrt{18}}{\sqrt{2}}$ 3

e. $3\sqrt{50} + 5\sqrt{32}$ $35\sqrt{2}$

f. $\sqrt{\frac{16}{49}}$ $\frac{4}{7}$

5. Rationalize the denominators.

a. $\frac{2}{\sqrt{6}}$ $\frac{\sqrt{6}}{3}$

b. $\frac{4}{2\sqrt{10}}$ $\frac{\sqrt{10}}{5}$

c. $\frac{8}{4+\sqrt{2}}$ $\frac{4(4-\sqrt{2})}{7}$

d. $\frac{11}{6-\sqrt{3}}$ $\frac{6+\sqrt{3}}{3}$

e. $\frac{6}{3-2\sqrt{2}}$ $6(3+2\sqrt{2})$

f. $\frac{2}{4^{\frac{1}{3}}}$ $\frac{4^{\frac{2}{3}}}{2}$ or $\sqrt[3]{2}$

6. Solve the Radical Equations. Check for Extraneous Solutions.

a. $\sqrt{x+10} - 3 = 2$

$$x=15$$

b. $\sqrt{4x+1} + 5 = 14$

$$x=20$$

c. $\sqrt[3]{3x-3} + 4 = 7$

$$x=10$$

d. $\sqrt[4]{2x+6} - 1 = 1$

$$x=5$$

e. $5x^{\frac{4}{3}} - 11 = 394$

$$x=27$$

f. $(x^2 + 4x - 13)^{\frac{2}{3}} = 4$

$$x=7 \quad x=3$$

c. $\sqrt{x} + \sqrt{x-5} = 1$

d. $\sqrt{2x+6} - \sqrt{x+4} = 1$

$$x=9$$

\nwarrow Extraneous
'doesn't work'

$$x=5$$

$x=-3 \nwarrow$ Extraneous

7. Find the Radical Domains.

a. $f(x) = \sqrt{2x-6}$

$$x \geq 3$$

b. $f(x) = \sqrt{15+2x-x^2}$

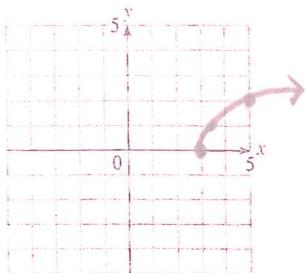
$$[-3, 5]$$

$$-3 \leq x \leq 5$$

8. Graph the Radicals by plotting points. Include at least 3 points.

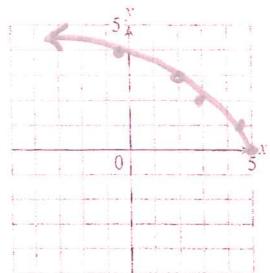
a. $y = \sqrt{2x - 6}$

x	y
3	0
5	2
3.5	1
11	4
7.5	3



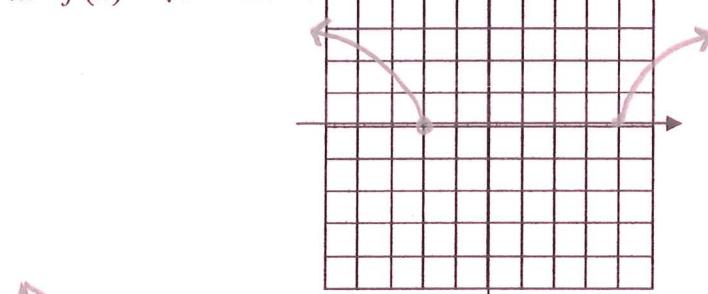
b. $y = \sqrt{15 - 3x}$

x	y
5	0
2	3
-1/3	4
14/3 = 4 2/3	1
14/3 = 3 2/3	2



9. Find the Domains and sketch the graphs of the following Radical Equations. Visibly visualize the polynomial graphs!

a. $f(x) = \sqrt{x^2 - 2x - 8}$

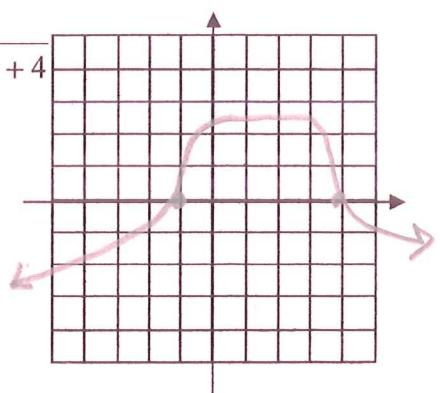


$$(-\infty, -2] \cup [4, \infty)$$

$$x \leq -2 \text{ or } x \geq 4$$

b. $f(x) = \sqrt[3]{-x^2 + 3x + 4}$

Any Real number

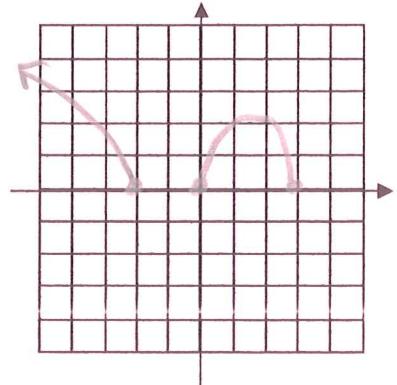


c. $f(x) = \sqrt{-x^3 + x^2 + 6x}$

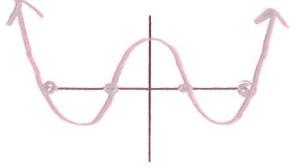


$$(-\infty, -2] \cup [0, 3]$$

$$x \leq -2 \text{ or } 0 \leq x \leq 3$$



d. $f(x) = \sqrt{x^4 - 29x^2 + 100}$



$$(-\infty, -5] \cup [-2, 2] \cup [5, \infty)$$

$$x \leq -5 \text{ or } -2 \leq x \leq 2 \text{ or } x \geq 5$$

