

NAME: Key DATE: _____ HOUR: _____

Section 7.6 and 7.7 Review

~~DUE BEFORE YOU LEAVE TODAY~~

Due Wed!
4/22/15

~~Turn in whatever you have done before you leave class.~~

Make sure to show all work for full credit!!

Write each expression in radical form. ^(root) Make sure to simplify if you can.

<p>1) $4^{\frac{1}{5}}$ $\sqrt[5]{4}$</p>	<p>2) $x^{\frac{5}{6}}$ $\sqrt[6]{x^5}$</p>	<p>3) $(t^4)^{\frac{2}{3}} = t^{\frac{8}{3}}$ $\sqrt[3]{t^8} = t^2 \sqrt[3]{t^2}$</p>
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Write each radical using rational exponents. ^(root) \rightarrow fractional Make sure to simplify if you can.

<p>4) $\sqrt[3]{71}$ $71^{\frac{1}{3}}$</p>	<p>5) $\sqrt[4]{16x^{12}y^3z}$ $2x^3y^{\frac{3}{4}}z^{\frac{1}{4}}$</p>	<p>6) $\sqrt{2a^{10}b}$ $2^{\frac{1}{2}}a^5b^{\frac{1}{2}}$</p>
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Evaluate each expression.

<p>7) $125^{\frac{1}{3}} = 5$</p>	<p>8) $1296^{\frac{1}{4}} = \frac{1}{1296^{\frac{1}{4}}}$ $= \frac{1}{6}$</p>	<p>9) $27^{\frac{1}{3}} \cdot 27^{\frac{4}{3}} = 27^{\frac{5}{3}}$ $= 243$</p>
<p>10) $\sqrt[5]{4} \cdot \sqrt[3]{16}$ $4^{\frac{1}{5}} \cdot 16^{\frac{1}{3}}$ $4^{\frac{3}{15}} \cdot 16^{\frac{5}{15}}$ $(2^2)^{\frac{3}{15}} \cdot (2^4)^{\frac{5}{15}}$ $2^{\frac{6}{15}} \cdot 2^{\frac{20}{15}} = 2^{\frac{26}{15}}$ $2^{\frac{15}{15}} \sqrt[15]{2^{11}}$ $= \sqrt[15]{2048}$</p>	<p>11) $\frac{27^{\frac{3}{4}}}{92^{\frac{1}{2}}} = \frac{(3^3)^{\frac{3}{4}}}{(3^2)^{\frac{1}{2}}} = \frac{3^{\frac{9}{4}}}{3^{\frac{1}{2}}}$ $= 3^{\frac{9}{4} - \frac{1}{2}} = 3^{\frac{5}{4}}$ $3\sqrt[4]{3}$</p>	<p>12) $\frac{8^{\frac{1}{3}}}{4^{\frac{1}{5}}} = \frac{(2^3)^{\frac{1}{3}}}{(2^2)^{\frac{1}{5}}} = \frac{2}{2^{\frac{2}{5}}}$ $= \frac{1}{2^{\frac{1}{5}}}$ $\frac{1}{2^{\frac{1}{5}}} \cdot \frac{2^{\frac{4}{5}}}{2^{\frac{4}{5}}} = \frac{2^{\frac{4}{5}}}{2}$ $= \frac{\sqrt[5]{16}}{2}$</p>

Simplify each expression.

13) $n^{\frac{1}{2}} \cdot n^{\frac{5}{4}}$

$$n^{2/4} \cdot n^{5/4} = n^{7/4}$$

$$= n\sqrt[4]{n^3}$$

14) $(x^{-\frac{1}{3}})^{-\frac{3}{5}}$

$$= x^{1/5}$$

15) $b^{\frac{2}{5}}$

$$= \frac{1}{b^{2/5}} \cdot \frac{b^{3/5}}{b^{3/5}}$$

$$= \frac{b^{3/5}}{b}$$

16) $\frac{h^{\frac{2}{3}}}{h^{\frac{4}{3}}} = \frac{h^{2/3}}{h^{4/3}}$

$$= \frac{1}{h^{1/3}} \cdot \frac{h^{1/3}}{h^{1/3}} = \frac{h^{1/3}}{h}$$

17) $\frac{3}{z^2-4} \cdot \frac{(z^{1/2}+4)}{(z^{1/2}+4)}$

$$= \frac{3\sqrt{z}+12}{z-16}$$

18) ${}^{10}\sqrt{c^5}$

$$= c^{5/10} = c^{1/2}$$

$$= \sqrt{c}$$

19) $\sqrt[4]{49x^6y^8}$

$$x^2 y^2 \sqrt[4]{49x^2}$$

20) $\sqrt{12} \cdot \sqrt[5]{12^3}$

$$12^{1/2} \cdot 12^{3/5}$$

$$12^{5/10} \cdot 12^{6/10} = 12^{11/10}$$

$$= 12\sqrt[10]{12}$$

21) $\frac{a}{\sqrt{3b}} \cdot \frac{\sqrt{3b}}{\sqrt{3b}}$

$$= \frac{a\sqrt{3b}}{3b}$$

Solve each of the following radical equations. Make sure to show all work and check your solution!!

$$22) \sqrt{x+3} - 4 = 12$$

$$\begin{array}{c} +4 \quad +4 \\ (\sqrt{x+3})^2 = 16^2 \end{array}$$

$$x+3 = 256$$

$$x = 253$$

Check:

$$\sqrt{253+3} - 4 = 12$$

$$\sqrt{256} - 4 = 12$$

$$12 = 12 \checkmark$$

$$23) 10 - (2x - 3)^{\frac{1}{2}} = 4$$

$$-\sqrt{2x-3} = -6$$

$$(\sqrt{2x-3})^2 = (6)^2$$

$$2x-3 = 36$$

$$2x = 39$$

$$x = 39/2$$

$$\text{Check: } 10 - \sqrt{2(39/2) - 3} = 4$$

$$10 - \sqrt{36} = 4$$

$$4 = 4 \checkmark$$

$$24) 8 + \sqrt[3]{4-x} = 12$$

$$(\sqrt[3]{4-x})^3 = 4^3$$

$$4-x = 64$$

$$-x = 60$$

$$x = -60$$

Check:

$$8 + \sqrt[3]{4+60} = 12$$

$$12 = 12 \checkmark$$

$$25) (\sqrt{2x-7})^2 = (\sqrt{x+2}-1)^2$$

$$2x-7 = x+2 - 2\sqrt{x+2} + 1$$

$$2x-7 = x+3 - 2\sqrt{x+2}$$

$$\begin{array}{c} -x-3 \quad -x-3 \\ \hline \end{array}$$

$$(x-10)^2 = (-2\sqrt{x+2})^2$$

$$x^2 - 20x + 100 = 4(x+2)$$

$$x^2 - 20x + 100 = 4x + 8$$

$$x^2 - 24x + 144 = -92 + 144$$

$$\sqrt{(x-12)^2} = \sqrt{52}$$

$$x-12 = \sqrt{52}$$

$$x = 12 + \sqrt{52}$$

no solution

check

$$\sqrt{24+2\sqrt{52}} - 7 = \sqrt{14+\sqrt{52}} - 1$$

$$5.6056 = 3.06$$

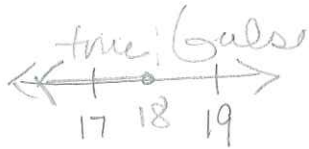
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Solve each of the following radical inequalities. Make sure to show all work! Your work must include a number line with the possible solutions and checking a number in each region of the number line you created!!!

26) $(\sqrt[3]{x+9})^3 \leq 3^3$

$x+9 \leq 27$

$x \leq 18$



$x=19$

$x=17$

$\sqrt[3]{19+9} \leq 3$

$3.03 \leq 3$

false

$\sqrt[3]{17+9} \leq 3$

$2.96 \leq 3$

true

27) $5 - \sqrt{3x-1} > 3$

$-\sqrt{3x-1} > -2$

$3x-1 \geq 0$

$(\sqrt{3x-1})^2 < 2^2$

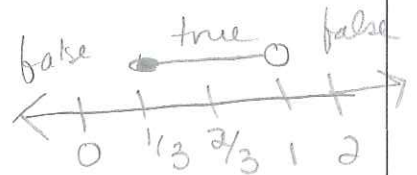
$3x \geq 1$

$x \geq 1/3$

$3x-1 < 4$

$3x < 3$

$x < 1$



$x=0$

$x=2/3$

$x=2$

$5 - \sqrt{-1} > 3$

false

$5 - \sqrt{2-1}$

$4 > 3$

true

$5 - \sqrt{5} > 3$

$2.7 > 3$

false

$1/3 \leq x < 1$

28) $10 + \sqrt{3x-9} < 2$

$(\sqrt{3x-9})^2 < (-8)^2$

$3x-9 < 64$

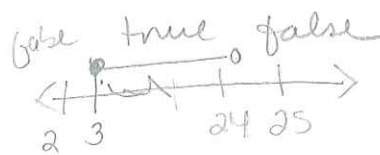
$3x < 73$

$x < 73/3$
24.3

$3x-9 \geq 0$

$3x \geq 9$

$x \geq 3$



Checks

$x=2$

$x=10$

$x=25$

$10 + \sqrt{-3} < 2$

false

$10 + \sqrt{21} < 2$

$14.6 < 2$
false

no solution

29) $(\sqrt{x+7}-2)^2 \geq (\sqrt{2x-5})^2$

$x+7-4\sqrt{x+7}+4 \geq 2x-5$

$(-4\sqrt{x+7})^2 \geq (x-16)^2$

$16(x+7) \geq x^2-32x+256$

$16x+112 \geq x^2-32x+256$

$0 \geq x^2-48x+144$

not factorable.