Algebra 2 Bellwork Thursday, April 30, 2015 3RD HR

1. Simplify. Use Absolute Value symbols as needed.

$\sqrt[4]{12a^3b^7c^{13}} \cdot \sqrt[4]{20a^6b^{19}c^7}$

2. Rationalize the denominator.

a) $\dfrac{48w^2y^7}{\sqrt[6]{27w^9x^6y^{13}}}$

b) $\dfrac{\sqrt{10}+4}{\sqrt{5}-\sqrt{2}}$

3. Simplify. Assume all variables are positive. Give fractional answers in reduced form.

$\left(\dfrac{16m^4}{n^{\frac{4}{3}}}\right)^{\frac{-3}{2}}$

4. solve each radical equation.

a) $(5x+16)^{\frac{1}{4}} = (x+2)^{\frac{1}{2}}$

b) $\sqrt{12-x}+6 = x$

c) $(x-5)^{\frac{3}{4}} - 6 = 2$

(1) $\sqrt[4]{12a^3b^7c^{13}} \cdot \sqrt[4]{20a^6b^{19}c^7} = \sqrt[4]{2^4 \cdot 3 \cdot 5\, a^9 b^{26} c^{20}}$

$12 = 4 \cdot 3 = 2 \cdot 2 \cdot 3$

$20 = 4 \cdot 5 = 2 \cdot 2 \cdot 5$

$= \boxed{2a^2b^6|c^5|\sqrt[4]{15ab^2}}$

(2) a) $\dfrac{48w^2y^7}{\sqrt[6]{27w^9x^6y^{13}}} \cdot \dfrac{\sqrt[6]{3^3w^3y^5}}{\sqrt[6]{3^3w^3y^5}} = \dfrac{48w^2y^7\sqrt[6]{3^3w^3y^5}}{3w^2xy^3}$

$27 = 3^3$

$\sqrt[6]{3^3w^3y^5} \cdot \sqrt[6]{3^3w^3y^5} = \sqrt[6]{3^6w^{12}x^6y^{18}}$

$= \boxed{\dfrac{16y^4\sqrt[6]{3^3w^3y^5}}{x}}$

b) $\dfrac{\sqrt{10}+4}{\sqrt{5}-\sqrt{2}} \cdot \dfrac{\sqrt{5}+\sqrt{2}}{\sqrt{5}+\sqrt{2}} = \dfrac{9\sqrt{2}+6\sqrt{5}}{5-2} = \dfrac{9\sqrt{2}+6\sqrt{5}}{3}$

	$\sqrt{5}$	$+\sqrt{2}$
$\sqrt{10}$	$\sqrt{50} = 5\sqrt{2}$	$\sqrt{20} = 2\sqrt{5}$
$+4$	$4\sqrt{5}$	$4\sqrt{2}$

$= 9\sqrt{2}+6\sqrt{5}$

$= \boxed{3\sqrt{2}+2\sqrt{5}}$

(3) $\left(\dfrac{16m^4}{n^{4/3}}\right)^{-3/2} = \left(\dfrac{n^{\frac{4}{3}}}{16m^4}\right)^{3/2} = \dfrac{n^{\frac{4}{3}\cdot\frac{3}{2}}}{16^{3/2} \cdot m^{4 \cdot 3/2}}$

$= \boxed{\dfrac{n^2}{64m^6}}$

(4) a) $\left((5x+16)^{\frac{1}{4}}\right)^4 = \left((x+2)^{\frac{1}{2}}\right)^4$

$5x+16 = (x+2)^2$

$5x+16 = x^2+4x+4$

$0 = x^2 - x - 12$

$0 = (x-4)(x+3)$

$x = 4, -3$

$x = 4$

b) $\sqrt{12-x} \quad +6 = x-6$

$\left(\sqrt{12-x}\right)^2 = (x-6)^2$

$12-x = x^2 - 12x + 36$

$0 = x^2 - 11x + 24$

$0 = (x-8)(x+3)$

$x = 8, 3$

$x = 8$

c) $(x-5)^{\frac{3}{4}} - 6 = 2$

$+6 \quad +6$

$\left((x-5)^{3/4}\right)^{4/3} = (8)^{4/3}$

$x - 5 = 16$

$x = 21$