Algebra 2 Bellwork Thursday, March 3, 2016

1. Write each in radical form.

a) $8(11m^3)^{\frac{7}{6}}$ b) $7bc^{\frac{1}{2}}$

2. Write each in exponential form.

a) $\sqrt[7]{5r^3}$ b) $9\sqrt{(2c)^5}$

3. Simplify each, use absolute value symbols where necessary.

a) $\sqrt[5]{160c^8d^{13}}$ b) $\sqrt[4]{27w^{12}x^{27}y^{23}}$

4. Simplify each. Assume all variables are positive.

a) $\sqrt{125} - 6\sqrt{80} + 2\sqrt{45}$ b) $\sqrt[3]{18m^5n} \cdot \sqrt[3]{30m^2n^7} \cdot \sqrt[3]{12mn^8}$

5. Simplify. Assume all variables are positive. No decimals. Give fractional answers in reduced form.

a) $(3w^{-\frac{5}{2}})^4$ b) $\left(\frac{-8w^4x^{-7}}{w^{-5}x^{-2}}\right)^{-\frac{4}{3}}$

6. Simplify. Assume all variables are positive. Rationalize denominators.

a) $\frac{\sqrt[3]{27a^{-6}b^{22}c^2}}{\sqrt[3]{108a^{13}b^7c^{10}}}$ b) $\frac{12}{3+\sqrt{5}}$

Algebra 2 Bellwork Thursday, March 3, 2016 ANSWERS

1. Write each in radical form.

a) $8(11m^3)^{\frac{7}{6}} = 8\sqrt[6]{(11m^3)^7}$ or $8\left(\sqrt[6]{11m^3}\right)^7$

b) $7bc^{\frac{1}{2}} = 7b\sqrt{c}$

2. Write each in exponential form.

a) $\sqrt[7]{5r^3} = (5r^3)^{\frac{1}{7}}$

b) $9\sqrt{(2c)^5} = 9(2c)^{5/2}$

3. Simplify each, use absolute value symbols where necessary.

$2^5=32$, $3^5=243$, 4^5

a) $\sqrt[5]{160c^8d^{13}}$ $32\cdot 5$

$= 2cd^2\sqrt[5]{5c^3d^3}$

b) $\sqrt[4]{27w^{12}x^{27}y^{23}}$

$= |w^3| \cdot x^6 \cdot |y^5| \cdot \sqrt[4]{27x^3y^3}$

4. Simplify each. Assume all variables are positive.

a) $\sqrt{125} - 6\sqrt{80} + 2\sqrt{45}$ $25\cdot 5$, $16\cdot 5$, $9\cdot 5$

$= 5\sqrt{5} - 24\sqrt{5} + 6\sqrt{5}$

$= -13\sqrt{5}$

b) $\sqrt[3]{18m^5n} \cdot \sqrt[3]{30m^2n^7} \cdot \sqrt[3]{12mn^8}$

$2^3=8$, $3^3=27$, $4^3=64$, $5^3=125$, $6^3=216$, $7^3=343$, $8^3=512$

$= \sqrt[3]{6480m^8n^{16}}$ $216\cdot 30$

$= 6m^2n^5\sqrt[3]{30m^2n}$

or $18 \cdot 30 \cdot 12$ ($6\cdot 3$, $6\cdot 5$, $6\cdot 2$)

$= 6^3 \cdot 3 \cdot 5 \cdot 2$

$= 6^3 \cdot 30$

$\Rightarrow \sqrt[3]{6^3 \cdot 30}$

$= 6\sqrt[3]{30}$

5. Simplify. Assume all variables are positive. No decimals. Give fractional answers in reduced form.

a) $(3w^{-\frac{5}{2}})^4 = 3^4 \cdot \left(w^{-\frac{5}{2}}\right)^4$

$= 81 \cdot w^{-10}$

$= \frac{81}{w^{10}}$

b) $\left(\frac{-8w^4x^{-7}}{w^{-5}x^{-2}}\right)^{-\frac{4}{3}} = \left(\frac{-8w^9}{x^5}\right)^{-\frac{4}{3}} = \left(\frac{x^5}{-8w^9}\right)^{\frac{4}{3}}$

$= \frac{x^{5\cdot\frac{4}{3}}}{(-8)^{4/3} \cdot w^{9\cdot 4/3}} = \frac{x^{\frac{20}{3}}}{16w^{12}}$

6. Simplify. Assume all variables are positive. Rationalize denominators.

a) $\frac{\sqrt[3]{27a^{-6}b^{22}c^2}}{\sqrt[3]{108a^{13}b^7c^{10}}}$

$= \frac{\sqrt[3]{b^{15}}}{\sqrt[3]{4a^{19}c^8}}$

$= \frac{b^3}{\sqrt[3]{4a^{19}c^8}} \cdot \frac{\sqrt[3]{2a^2c}}{\sqrt[3]{2a^2c}} = \frac{b^3\sqrt[3]{2a^2c}}{\sqrt[3]{2^3a^{21}c^9}} = \frac{b^3\sqrt[3]{2a^2c}}{2a^7c^3}$

b) $\frac{12}{3+\sqrt{5}} \cdot \frac{3-\sqrt{5}}{3-\sqrt{5}} = \frac{12(3-\sqrt{5})}{9-5} = \frac{12(3-\sqrt{5})}{4}$

$= 3(3-\sqrt{5})$ or $9-3\sqrt{5}$