<u>Algebra 1:</u> <u>Problem Set 5</u> Radical notation, rational exponents, and simplification of radical expressions

Evaluate:

1. $27^{2/3}$
2. $(-32)^{2/5}$
3. $\left(\frac{9}{16}\right)^{-1/2}$
4. $\sqrt{63}$
5. $\sqrt[3]{250}$
6. $\left(\sqrt{6}+\sqrt{2}\right)\left(2\sqrt{6}-3\sqrt{2}\right)$
7. $2\sqrt{8}-3\sqrt{2}+\sqrt{32}$
8. $(\sqrt{3}-2)(\sqrt{3}+2)$
9. $\frac{8}{\sqrt{3}-4}$
10. $\frac{2}{\sqrt{5}}$

Simplify:

11. $\left(2x^3y\right)^3\left(4x^{-2}y\right)^{-2}$
12. $\frac{4x^5x^{-2}}{2x}$
13. $\left(\frac{3x^2y^{-1}}{7x^3y}\right)^{-2}$
14. $\frac{x^{-1}-y^{-1}}{x+y}$
15. $\sqrt[3]{27x^6y^5}$

<u>Solutions to Odd Problems</u>:

1.

$27^{2/3}$

$(27^{1/3})^2 \quad or \left(\sqrt[3]{27}\right)^2$

3^2

9

3.

$\left(\frac{9}{16}\right)^{-1/2}$

$\left(\frac{16}{9}\right)^{1/2}$

$\frac{4}{3}$

5.

$\sqrt[3]{250}$

$\sqrt[3]{125\cdot 2}$

$5\sqrt[3]{2}$

7.

$2\sqrt{8}-3\sqrt{2}+\sqrt{32}$

$2\cdot 2\sqrt{2}-3\sqrt{2}+4\sqrt{2}$

$4\sqrt{2}-3\sqrt{2}+4\sqrt{2}$

$5\sqrt{2}$

continued on next page

9.

$$\frac{8}{\sqrt{3}-4}$$

$$\frac{8}{\sqrt{3}-4}\cdot\frac{\sqrt{3}+4}{\sqrt{3}+4}$$

$$\frac{8(\sqrt{3}+4)}{3-16}$$

$$\frac{8(\sqrt{3}+4)}{-13}$$

11.

$$\left(2x^3y\right)^3\left(4x^{-2}y\right)^{-2}$$

$$\left(2^3x^9y^3\right)\left(\frac{4y}{x^2}\right)^2$$

$$\left(8x^9y^3\right)\left(\frac{x^2}{4y}\right)^2$$

$$\left(8x^9y^3\right)\left(\frac{x^4}{16y^2}\right)$$

$$\frac{x^{13}y}{2}$$

13.

$$\left(\frac{3x^2y^{-1}}{7x^3y}\right)^{-2}$$

$$\left(\frac{3}{7xy^2}\right)^{-2}$$

$$\left(\frac{7xy^2}{3}\right)^2$$

$$\frac{49x^2y^4}{9}$$

15.

$$\sqrt[3]{27x^6y^5}$$

$$\sqrt[3]{27}\,\sqrt[3]{x^6}\,\sqrt[3]{y^3}\,\sqrt[3]{y^2}$$

$$3x^2y\,\sqrt[3]{y^2}$$

<u>Answers to Even Problems:</u>

2. 4 4. $3\sqrt{7}$ 6. $6-2\sqrt{3}$ 8. -1

10. $\frac{2\sqrt{5}}{5}$ 12. $2x^2$ 14. $\frac{y-x}{xy(x+y)}$