

Name: ANSWER KEY Hour: _____

Rational Exponents and Radicals Worksheet (7.2B & 7.2C)

Rewrite each expression in radical notation.

1. $4^{\frac{1}{5}}$ $\sqrt[5]{4}$

2. $x^{\frac{3}{2}}$ $\sqrt{x^3}$ OR $(\sqrt{x})^3$

3. $(7y)^{\frac{3}{2}}$ $\sqrt{(7y)^3}$ OR $(\sqrt{7y})^3$

5. $4v^{\frac{2}{5}}$ $4\sqrt[5]{v^2}$ OR $4(\sqrt[5]{v})^2$

Rewrite each expression in rational exponent notation.

6. $\sqrt{p}$ $p^{\frac{1}{2}}$

7. $\sqrt[3]{y^2}$ $y^{\frac{2}{3}}$

8. $2(\sqrt[5]{50})^2$ $2 \cdot 50^{\frac{2}{5}}$

9. $\sqrt[3]{m^3}$ $m^{\frac{3}{9}} = m^{\frac{1}{3}}$

Simplify each expression.

10. $16^{\frac{1}{2}} = \sqrt{16} = 4$

11. $(\sqrt{9})^2 = (3)^2 = 9$

12. $27^{-\frac{2}{3}}$ $= \frac{1}{27^{\frac{2}{3}}} = \frac{1}{(\sqrt[3]{27})^2} = \frac{1}{(3\sqrt{3})^2}$
 $= \frac{1}{27(\sqrt{3})^2}$
 I think the problem was supposed to be $27^{-\frac{2}{3}}$ because that answer is $\frac{1}{9}$

13. $(\sqrt[3]{125})^4 = (5)^4 = 625$

Simplify each expression. Use absolute value symbols where required.

$$14. \sqrt{100} = 10$$

$$15. \sqrt[3]{125x^3} = 5x$$

$$16. \sqrt[4]{1000m^8} = m^2 \sqrt[4]{1000}$$

this was supposed to be $\sqrt[4]{10,000m^8} = 10m^2$

$$17. \sqrt[5]{32p^{10}r^{15}} = 2p^2r^3$$

$$18. \sqrt[4]{\frac{81a^4b^{12}}{16c^8}} = \frac{3a|b^3|}{2c^2}$$

need absolute value around the b since exponent changed from even (12) to odd (3)

$$19. (8x^6y^9z^3)^{\frac{2}{3}}$$

$$= 8^{\frac{2}{3}} x^{12/3} y^{18/3} z^{6/3}$$

$$= 4x^4y^6z^2$$

$$20. \left(\frac{243p^{10}}{q^{20}r^5} \right)^{\frac{2}{5}}$$

$$= \frac{243^{\frac{2}{5}} p^{20/5}}{q^{40/5} r^{10/5}}$$

$$= \frac{9p^4}{q^8r^2}$$

$$21. \left(\frac{256a^{12}b^{16}}{625c^4d^{16}} \right)^{-\frac{1}{4}}$$

$$= \frac{256^{-1/4} a^{-12/4} b^{-16/4}}{625^{-1/4} c^{-4/4} d^{-16/4}}$$

all negative exponents so every base switches

$$= \frac{5/c/d^4}{4/a^3/b^4}$$

need absolute value around c and a