WORKSHEET #5 Simplifying Rational Exponents

Name: _____

Simplify.

1) $(n^4)^{\frac{3}{2}}$

2) $(27p^6)^{\frac{5}{3}}$

3) $(25b^6)^{-1.5}$

4) $(64m^4)^{\frac{3}{2}}$

5) $(a^8)^{\frac{3}{2}}$

6) $(9r^4)^{0.5}$

7) $(81x^{12})^{1.25}$

8) $(216r^9)^{\frac{1}{3}}$

Simplify. Your answer should contain only positive exponents with no fractional exponents in the denominator.

9) $2m^2 \cdot 4m^{\frac{3}{2}} \cdot 4m^{-2}$

10) $3b^{\frac{1}{2}} \cdot b^{\frac{4}{3}}$

11) $\left(p^{\frac{3}{2}}\right)^{-2}$

12) $\left(a^{\frac{1}{2}}\right)^{\frac{3}{2}}$

13) $\dfrac{2x^{-\frac{7}{4}}}{4x^{\frac{4}{3}}}$

14) $\dfrac{4x^2}{2x^{\frac{1}{2}}}$

15) $\dfrac{3x^{-\frac{1}{2}} \cdot 3x^{\frac{1}{2}} y^{-\frac{1}{3}}}{3y^{-\frac{7}{4}}}$

16) $\dfrac{3y^{\frac{1}{4}}}{4x^{-\frac{2}{3}} y^{\frac{3}{2}} \cdot 3y^{\frac{1}{2}}}$

17) $\left(m \cdot m^{-2} n^{\frac{5}{3}}\right)^2$

18) $\left(a^{-1} b^{\frac{1}{3}} \cdot a^{-\frac{4}{3}} b^2\right)^2$

19) $\left(\dfrac{x^{\frac{1}{2}}y^{-2}}{yx^{-\frac{7}{4}}}\right)^{4}$

20) $\dfrac{\left(x^{3}y^{2}\right)^{\frac{3}{2}}}{\left(x^{-1}y^{-\frac{2}{3}}\right)^{\frac{1}{4}}}$

21) $\dfrac{\left(x^{-\frac{1}{2}}y^{2}\right)^{-\frac{5}{4}}}{x^{2}y^{\frac{1}{2}}}$

22) $\dfrac{\left(x^{-\frac{1}{2}}y^{4}\right)^{\frac{1}{4}}}{x^{\frac{2}{3}}y^{\frac{3}{2}}\cdot x^{-\frac{3}{2}}y^{\frac{1}{2}}}$

ANSWERS:

1. n^{6} 2. $243p^{10}$ 3. $\dfrac{1}{125b^{9}}$ 4. $512m^{6}$ 5. a^{12} 6. $3r^{2}$

7. $243x^{15}$ 8. $6r^{3}$ 9. $32m^{\frac{3}{2}}$ 10. $3b^{\frac{11}{6}}$ 11. $\dfrac{1}{p^{3}}$ 12. $a^{\frac{3}{4}}$

13. $\dfrac{x^{\frac{11}{12}}}{2x^{4}}$ *or* $\dfrac{1}{2x^{\frac{37}{12}}}$ 14. $2x^{\frac{3}{2}}$ 15. $3y^{\frac{17}{12}}$ 16. $\dfrac{x^{\frac{2}{3}}y^{\frac{1}{4}}}{4y^{4}}$ *or* $\dfrac{x^{\frac{2}{3}}}{4y^{\frac{15}{4}}}$ 17. $\dfrac{n^{\frac{10}{3}}}{m^{2}}$

18. $\dfrac{a^{\frac{1}{3}}b^{\frac{14}{3}}}{a^{5}}$ *or* $\dfrac{b^{\frac{14}{13}}}{a^{\frac{14}{3}}}$ 19. $\dfrac{x^{9}}{y^{12}}$ 20. $x^{\frac{19}{4}}y^{\frac{19}{6}}$ 21. $\dfrac{x^{\frac{5}{8}}}{x^{2}y^{3}}$ *or* $\dfrac{1}{x^{\frac{11}{8}}y^{3}}$ 22. $\dfrac{x^{\frac{17}{24}}}{y}$