2.2 Practice Set

1. What do the numerator and the denominator mean in a rational exponent? Give an example.

Simplify each of the following. Assume that all variables represent positive real numbers.

2. $256^{\frac{1}{4}}$
3. $(25x^2)^{\frac{1}{2}}$
4. $(4y)^{\frac{1}{2}}$
5. $(-125)^{\frac{1}{3}}$
6. $-16^{\frac{1}{2}}$
7. $(-16)^{\frac{1}{2}}$
8. $(-8)^{\frac{2}{3}}$
9. $-8^{\frac{2}{3}}$
10. $(27x)^{-\frac{1}{3}}$
11. $x^{-\frac{5}{4}} \cdot x^{\frac{1}{4}}$
12. $\dfrac{y^{\frac{1}{8}}}{y^{\frac{1}{3}}}$

13. $\dfrac{a^{\frac{3}{5}}a^{\frac{6}{5}}}{a^{-\frac{1}{5}}}$

14. $\dfrac{\left(4x^{\frac{2}{3}}\right)^2}{x^{\frac{1}{3}}}$

15. $\dfrac{\left(xy^2\right)^{\frac{1}{5}}}{x^{\frac{1}{5}}y^{-\frac{1}{5}}}$

16. $\dfrac{\left(27a^3b^6\right)^{\frac{2}{3}}}{\left(16a^{-3}b^{-4}\right)^{\frac{1}{2}}}$

17. $y^{\frac{1}{2}}(y^{\frac{1}{2}} - 2y^{\frac{3}{2}})$

18. $m^{\frac{1}{3}}(3m - 1)$

19. $\sqrt[6]{x^2}$ (Hint: Rewrite using a rational exponent)

20. $\dfrac{\sqrt[3]{r^2}}{\sqrt[5]{r}}$ (Hint: Rewrite using a rational exponent)

Distributed Practice Problems

Simplify each of the following. Assume that all variables represent positive real numbers.

21. $\sqrt[5]{-243x^{20}y^{13}}$

22. $\sqrt{252x^{18}y^3z^2}$

Divide.

23. $\dfrac{36x^3+3x^2-8x+1}{x-\frac{1}{3}}$

24. $(8x^2y - 14xyz + 20x^2yz^3) \div (-2x^2y)$

25. $(9x^4 + 3x^3 - 12x - 4) \div (3x + 1)$