Powers Review

Answer Key

1. Write $186^{4/5}$ as a radical. $\sqrt[5]{186^4}$

2. Write $\sqrt[8]{\left(\frac{684}{15}\right)^{11}}$ as a power. $\left(\frac{684}{15}\right)^{11/8}$

3. Evaluate $0.09^{1/2}$ without using a calculator. (Express as a radical and then evaluate)

$\left(\frac{9}{100}\right)^{1/2}$

$\sqrt{\frac{9}{100}}$

$\frac{3}{10}$

4. Evaluate $(-8)^{-1/3}$ without using a calculator. (Express as a radical and then evaluate)

$(-8)^{-1/3}$

$= \frac{1}{(-8)^{1/3}}$

$= \frac{1}{\sqrt[3]{-8}}$

$= \frac{1}{-2}$

5. Evaluate $\left(\frac{16}{625}\right)^{1/4}$ without using a calculator. (Express as a radical and then evaluate)

$\sqrt[4]{\frac{16}{625}}$

$= \frac{2}{5}$

6. Evaluate $\left(\frac{125}{8}\right)^{\frac{4}{3}}$.

a. $\frac{625}{4}$

b. 7.858 958...

c. $\frac{625}{16}$

d. $\frac{625}{8}$

$\sqrt[3]{\frac{125}{8}}^4$

$\left(\frac{5}{2}\right)^4$

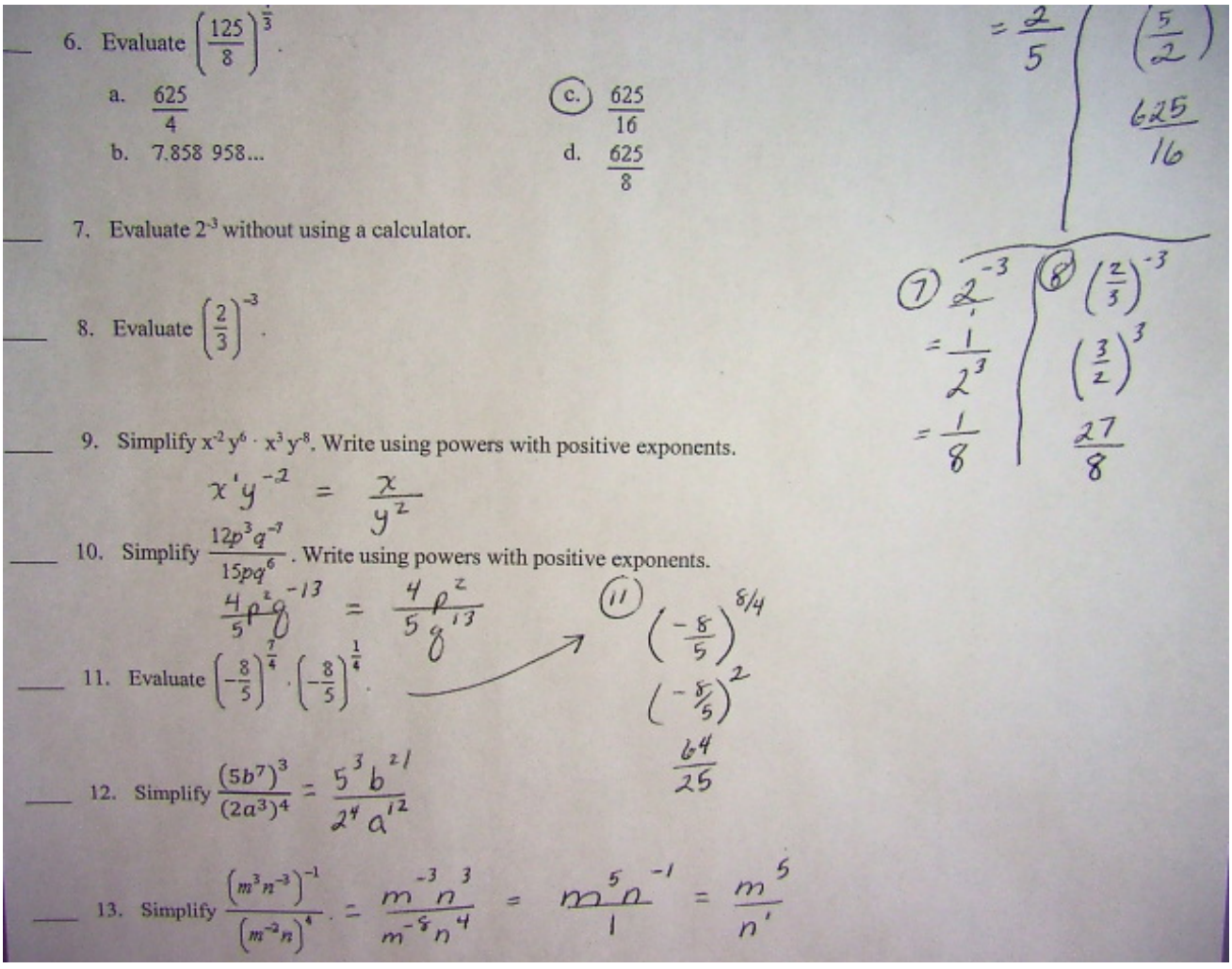
$\frac{625}{16}$

7. Evaluate 2^{-3} without using a calculator.

2^{-3}

8. Evaluate $\left(\frac{2}{3}\right)^{-3}$

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



6. Evaluate $\left(\frac{125}{8}\right)^{\frac{1}{3}}$.

a. $\frac{625}{4}$ c. $\frac{625}{16}$

b. 7.858 958... d. $\frac{625}{8}$

7. Evaluate 2^{-3} without using a calculator.

8. Evaluate $\left(\frac{2}{3}\right)^{-3}$.

9. Simplify $x^{-2}y^{6} \cdot x^{3}y^{-8}$. Write using powers with positive exponents.

$x^{1}y^{-2} = \frac{x}{y^{2}}$

10. Simplify $\frac{12p^{3}q^{-7}}{15pq^{6}}$. Write using powers with positive exponents.

$\frac{4}{5}p^{2}q^{-13} = \frac{4p^{2}}{5q^{13}}$

11. Evaluate $\left(-\frac{8}{5}\right)^{\frac{7}{4}} \cdot \left(-\frac{8}{5}\right)^{\frac{1}{4}}$.

12. Simplify $\frac{(5b^{7})^{3}}{(2a^{3})^{4}} = \frac{5^{3}b^{21}}{2^{4}a^{12}}$

13. Simplify $\frac{(m^{3}n^{-3})^{-1}}{(m^{-2}n)^{4}} = \frac{m^{-3}n^{3}}{m^{-8}n^{4}} = \frac{m^{5}n^{-1}}{1} = \frac{m^{5}}{n^{1}}$

$= \frac{2}{5}$ $\left(\frac{5}{2}\right)$ $\frac{625}{16}$

(7) 2^{-3} $= \frac{1}{2^{3}}$ $= \frac{1}{8}$

(8) $\left(\frac{2}{3}\right)^{-3}$ $\left(\frac{3}{2}\right)^{3}$ $\frac{27}{8}$

(11) $\left(-\frac{8}{5}\right)^{8/4}$ $\left(-\frac{8}{5}\right)^{2}$ $\frac{64}{25}$

11. Evaluate $\left(-\frac{8}{5}\right)^{\frac{7}{4}} \cdot \left(-\frac{8}{5}\right)^{\frac{1}{4}}$

$\left(-\frac{8}{5}\right)^{2}$

$\frac{64}{25}$

12. Simplify $\frac{(5b^7)^3}{(2a^3)^4} = \frac{5^3 b^{21}}{2^4 a^{12}}$

13. Simplify $\frac{\left(m^3 n^{-3}\right)^{-1}}{\left(m^{-2} n\right)^4} = \frac{m^{-3} n^3}{m^{-8} n^4} = \frac{m^5 n^{-1}}{1} = \frac{m^5}{n^1}$

Evaluate:

a) $2401^{3/4}$

$\sqrt[4]{2401}^{3}$

7^3

343

b) $32^{-0.4}$

$= 32^{-4/10}$

$= 32^{-2/5}$

$= \frac{1}{32^{2/5}}$

$= \frac{1}{\sqrt[5]{32}^{2}}$

$= \frac{1}{2^2} = 1/4$

Simplify:

a) $\left(\frac{(6x^8y^{-3} \cdot x^{11}y^3)}{(2xy^7)}\right)^{-2}$

$\left(\frac{6x^{19}y^0}{2xy^7}\right)^{-2}$

$(3x^{18}y^{-7})^{-2}$

$\frac{3^{-2}x^{-36}y^{14}}{1} = \frac{y^{14}}{3^2 x^{36}}$

b) $\left(\frac{5^6x^3y^5}{5x^{-2}y^3}\right)^3$

$(5^5x^5y^2)^3$

$5^{15}x^{15}y^6$