

- (21) 1
 (23) $\frac{1}{16}$
 (25) $\frac{1}{343}$
 (27) 256
 (29) $\frac{1}{8}$
 (31) $\frac{1}{36}$
 (33) 64

- (35) $\frac{1}{9}$
 (37) $\frac{1}{400}$
 (39) $\frac{1}{16}$
 (41) 0.0313
 (43) 0.0016
 (45) 0.0625

- (47) 0.0714
 (49) The 5 should not be raised to a negative power, $\frac{5}{x^3}$
 (51) $\frac{1}{x^5}$
 (53) $\frac{y^4}{x^2}$
 (55) x^2
 (57) $x^{10}y^4$
 (59) $\frac{1}{64x^3}$
 (61) $\frac{216}{x^3}$

8.4 Division Properties of Exponents

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Recall

$$\frac{4^5}{4^3} = \frac{4 \cdot 4 \cdot 4 \cdot 4 \cdot 4}{4 \cdot 4 \cdot 4} = \frac{4 \cdot 4}{1} = 4^2$$

How do we get there? we think we sub. the exp.

Quotient of Powers: to divide Powers with the Same Base, you Subtract the Exponents.

$$\text{ex1)} \quad \frac{6^5}{6^4} = 6^{5-4} = 6^1 = \underline{\underline{6}}$$

$$\text{ex2)} \quad \frac{x^3}{x^5} = x^{3-5} = x^{-2} = \frac{1}{x^2}$$

$$\text{ex3)} \quad \frac{(-3)^3}{(-3)^2} = (-3)^{3-2} = (-3)^1 = \underline{\underline{-3}}$$

Power of a Quotient: First find the Power of the Numerator, then find the Power of the Denominator, and Divide.

Recall:

$$\left(\frac{2}{3}\right)^4 = \frac{2}{3} \cdot \frac{2}{3} \cdot \frac{2}{3} \cdot \frac{2}{3} = \frac{2 \cdot 2 \cdot 2 \cdot 2}{3 \cdot 3 \cdot 3 \cdot 3} = \frac{2^4}{3^4}$$

Prod. of Power	Add Expt.
* Power of Power	Multiply Expt.
Power of Prod.	Power of Each + Multi
Quot. of Power	Subt. Expt.
Power of Quot.	Power of Each + Divide

$$\text{ex4)} \quad \left(\frac{2}{3}\right)^2 = \frac{2^2}{3^2} = \frac{4}{9}$$

All #'s Must
Be taken to
their Power unless
told otherwise

$$\text{ex5)} \quad \left(\frac{-3}{y}\right)^3 = \frac{(-3)^3}{y^3} = \frac{-27}{y^3}$$

$$\text{ex6)} \quad \left(\frac{7}{4}\right)^{-3} = \frac{7^{-3}}{4^{-3}} = \frac{4^3}{7^3} = \frac{64}{343}$$

$$\text{ex7)} \quad \left(\frac{3}{5}\right)^{-2} = \frac{3^{-2}}{5^{-2}} = \frac{5^2}{3^2} = \frac{25}{9}$$

ex 8

$$\frac{2x^2y}{3x} \cdot \frac{9xy^2}{y^4} = \frac{6x^3y^3}{3xy^4} = \frac{6x^{3-1}y^{3-4}}{1}$$

Something from the top will cancel or reduce w/ something from the bottom

$$= \frac{6x^2y^{-1}}{1} = \frac{6x^2}{y}$$

$$= \frac{6x^2y^3}{3xy^4} = \frac{6x^2}{y}$$

ex 9)

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

Quoit -
of
powers

Power of
Power

Power
of
Prod.

ex 10)

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

$$= \cancel{x} \cancel{y} \cdot \frac{y^3}{x^6}$$

$$= \frac{y^4}{x^5}$$

O.T.L.

* ① Pg 452-453

21-61 (odd)

② Pg 464-465: 1, 2, 4-10(e),

19-23(o), 26-32(e),

33-57(o)

Show All Work ...

Not Just The Answers!

③ Turn in
Grade
Sheets

④ Turn
Wk. St. in
8.1

by
Fan

(21)

$$3^0 = \underline{\underline{1}}$$

$$0^0 = \underline{\text{undefined}}$$