

(a) $\frac{x^{-3}x^2}{x^{-4}}$

No flipping since no addition.

OoO-1b: In a fraction treat numerator and denominator independently until each is simplified.

$$\frac{x^{-3+2}}{x^{-4}} = \frac{x^{-1}}{x^{-4}}$$

Multiply the bases \Rightarrow add the exponents

$$x^{-1-(-4)} = x^{-1+4}$$

Divide the basis \Rightarrow subtract the exponents

$$x^3$$

(Note: no flipping was needed)

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

No flipping since no addition.

OoO-1a: work inside \rightarrow out

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

Divide the bases \Rightarrow subtract the exponents

$$\left(x^{-2}y^{1+3}\right)^{-2} = \left(x^{-2}y^4\right)^{-2}$$

The inside is done, so ease our way out

$$\left(x^{-2}\right)^{-2} \left(y^4\right)^{-2}$$

Put the power through the product

$$x^{(-2)(-2)} y^{4(-2)}$$

Power to a power \Rightarrow multiply the powers

$$x^4 y^{-8}$$

Now flip

$$\frac{x^4}{y^8}$$

(c) $2^2 + 2^{-3}$

Addition with negative exponents \Rightarrow flip first

$$2^2 + \frac{1}{2^3}$$

$$4 + \frac{1}{8} = \frac{4}{1} + \frac{1}{8} = \frac{32 + 1}{8}$$

$$\frac{33}{8}$$

(d) $\frac{2^{-1} + 2^2}{2^{-2}}$

Addition with negative exponents \Rightarrow flip first

$$\frac{\frac{1}{2} + 2^2}{\frac{1}{2^2}}$$

OoO-1b: Treat numerator and denominator independently.

$$\frac{1}{2^2}$$

In this case, this means the result of any flipping being done from something in the numerator must remain in the

