Questions?

§1.3 Prerequisite skills.

Integer exponents

Rational exponents interpreted as roots.

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Time to brush up on the meaning and properties of exponents. Section 1.3, objectives 3 and 4 look like something you ought to know like the back of your hand before trying Chapter 5. You ought to be able to work anything in 1.3. This knowledge is the *starting point* of discussion in lecture.

$3^4 = \underbrace{3 \cdot 3 \cdot 3 \cdot 3}_{4 \text{ of 'em}}$

$3^4 \cdot 3^2 = (3 \cdot 3 \cdot 3 \cdot 3)(3 \cdot 3)$

$= 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3$

$= 3^6$

$x^n = \underbrace{x \cdot x \cdot \cdots x}_{n \text{ of 'em}}$

$x^n \cdot x^m = (\underbrace{x \cdot x \cdots x}_{n})(\underbrace{x \cdots x}_{m}) = \underbrace{x \cdot x \cdots x}_{n+m} = x^{n+m}$

$(x^n)^m = \underbrace{(\underbrace{x \cdots x}_{n})(\underbrace{x \cdots x}_{n}) \cdots (\underbrace{x \cdots x}_{n})}_{m \text{ of 'em}} = x^{mn}$

$(3^2)^4 = \underbrace{(3 \cdot 3)(3 \cdot 3)(3 \cdot 3)(3 \cdot 3)}_{4} = 3^{2 \cdot 4} = 3^8$

$$\frac{x^m}{x^n} = x^{m-n}$$

$$\frac{3^4}{3^2} = \frac{3\cdot 3\cdot 3\cdot 3}{3\cdot 3} = 3\cdot 3 = 3^2 = 3^{4-2}$$

$m^1 \cdot m^7 \cdot m^6 = m^{1+7+6} = m^{14}$ $\quad ab = ba$

$$(-4x^3p^2)(4y^3x^3) = -16x^{3+3}p^2y^3 = -16x^6p^2y^3$$

$$= (-4)(4)(x^3)(x^3)(p^2)(y^3) = \uparrow$$

$$\frac{x^9y^6}{x^8y^6} = x^{9-8}y^{6-6} = x^1y^0 = x^1$$

$$0 = 1$$

$$\frac{x^2}{x^5} = x^{2-5} = x^{-3} = \frac{1}{x^3}$$

$$\frac{1}{x^{-5}} = x^5$$

$$\frac{p^{-13}}{p^{-3}} = p^{-13-(-3)} = p^{-10} = \frac{1}{p^{10}}$$

#s 29-48 Final answers using only positive exponents

$$10b^{-1} = \frac{10}{b}$$

$$(5x)^0 + 5x^0 =$$

$$1 + 5 = 6$$

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$1^{-3} - 4^{-2} =$

$\frac{1}{1^3} - \frac{1}{4^2}$

$= 1 - \frac{1}{16}$

$= \frac{1}{1} \cdot \frac{16}{16} - \frac{1}{16}$

$= \frac{16}{16} - \frac{1}{16}$

$= \frac{15}{16}$

$\frac{x^{-5}y^{7}}{x^{-2}y^{-3}} =$

$x^{-5-(-2)}y^{7-(-3)}$

$= x^{-5+2}y^{7+3}$

$= x^{-3}y^{10} = \boxed{\frac{y^{10}}{x^3}}$

$3000 = 3 \times 1000 = 3 \times 10^3$

$3287 = 3.287 \times 10^3$

$.00000089654 = 8.9654 \times 10^{-7}$

$(5 \times 10^{11})(2.9 \times 10^{-3}) = (5)(2.9) \times 10^8$

$= 14.5 \times 10^8$

$= 1.45 \times 10^1 \times 10^8$

$= 1.45 \times 10^9$

Always between 1 & 10.

$$\frac{.00048}{.0016} = \frac{4.8 \times 10^{-4}}{1.6 \times 10^{-3}} = \frac{4.8}{1.6} \times 10^{-4-(-3)}$$

$$= 3 \times 10^{-1}$$

$$(xy)^2 = x^2 y^2$$

$$(x+y)^2 = x^2 + y^2$$ Nooooo!

$$(-x^1 y^0 x^2 a^3)^{-3}$$

$$(-1 x^3 a^3)^{-3} = (-1)^{-3}(x^3)^{-3}(a^3)^{-3}$$

$$= \frac{1}{(-1)^3} x^{(3)(-3)} a^{(3)(-3)}$$

$$= \frac{1}{-1} x^{-9} a^{-9}$$

$$= -1 \cdot \frac{1}{x^9} \cdot \frac{1}{a^9} = -\frac{1}{x^9 a^9}$$

Got it right, man.

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$$\frac{16x^{-5-3a}y^{-2a-b}}{2x^{-5+3b}y^{2b-a}}$$

→ Miscopy, Steve.

$$= \frac{16}{2}x^{-5-3a-(-5+3b)}y^{-2a-b-(2b-a)}$$

$$= 8x^{-5-3a+5-3b}y^{-2a-b-2b+a}$$

$$= 8x^{-3a-3b}y^{-a-3b} = 8x^{-(3a+3b)}y^{-(a+3b)}$$

$$= \frac{8}{x^{3a+3b}y^{a+3b}}$$

§5.1 As many odds as you need to master the material.

§5.2 Same. C

Come with questions on Tuesday.

Quiz Tuesday on props of exponents & Scientific Notation.

Open Notes. Taken from odd-#ed problems in 5.1, 5.2

→ Instead of Collecting Homework.

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