

Section 7-4 Division Properties of Exponents

Students will be able to:
-divide powers with the same base
-raise a quotient to a power

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Simplify:

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

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What is the general rule dividing powers with the same base?

Subtract exponents when
dividing bases

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Simplify:

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

$$\frac{r^{\frac{5}{6}}}{r^{\frac{1}{6}}} = r^{\frac{5}{6}-\frac{1}{6}} = r^{\frac{4}{6}} = r^{\frac{2}{3}}$$

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Simplify:

$$\frac{t^{\frac{7}{2}}}{t^3} = t^{\frac{7}{2}-3} = t^{\frac{7}{2}-\frac{6}{2}} = t^{\frac{1}{2}}$$

$$\frac{x^2 y^5}{x y^7} = x^{2-1} y^{5-7} = x^1 y^{-2} = \frac{x}{y^2}$$

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Dividing numbers in scientific notation:

During one year, Honduras had a population of 7.33×10^6 people. The area of Honduras is 4.33×10^4 mi². What was the population density of Honduras that year?

$$\frac{7.33 \times 10^6}{4.33 \times 10^4} = 1.692 \times 10^2$$

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When raising a quotient to a power, you must raise all parts of the numerator and denominator to the power and then simplify.

$$\left(\frac{a}{b^2}\right)^2 = \frac{a^2}{b^4}$$

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Simplify:

$$\left(\frac{2}{7}\right)^3 = \frac{2^3}{7^3} = \frac{8}{343}$$

$$\left(\frac{x^2}{y^3}\right)^5 = \frac{x^{2 \cdot 5}}{y^{3 \cdot 5}} = \frac{x^{10}}{y^{15}}$$

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Simplify:

$$\left(\frac{z^{\frac{2}{3}}}{4}\right)^3 = z^{\frac{2}{3} \cdot 3} \cdot \frac{3}{3} \cdot \frac{6}{3} = 2$$

$$\frac{z^2}{4^3} = \frac{z^2}{64}$$

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Simplify:

Simplify inside the parenthesis 1st

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

$$= (x y^{-4})^4 = x^{1 \cdot 4} y^{-4 \cdot 4}$$

$$= x^4 y^{-16} = \frac{x^4}{y^{16}}$$

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Simplify:

$$\left(\frac{x}{y^2}\right)^{-2} = \frac{x^0 2}{y^4} = \frac{2}{x^2}$$

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Hwk: pg. 442-445

#8 - 48 (4th), 50 - 54 (evens)

60 - 66 (evens), 70 - 78 (evens)

83, 88

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Attachments

7-4cont.notebook