Math Virtual Learning

Algebra 2/Honors Algebra 2

April 15, 2020

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Lesson: April 15, 2020

Objective/Learning Target:
Students will be able to simplify expressions using the multiplication and division rules of exponents.

Let's Get Started:
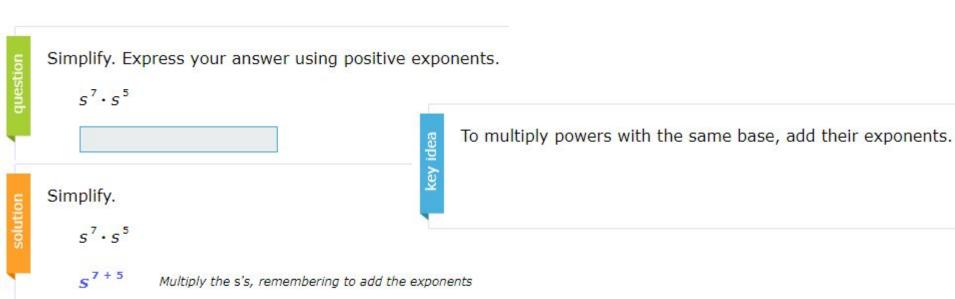Get out a sheet of paper and simplify the expression

$$\frac{-7x^{-3}(yz)^0}{a^0 b^{-2} c}$$

Watch 2 Videos:
On the same sheet of paper, watch both videos for Multiplication Rule & Division Rule and take notes

Multiplication Rule Practice:

1. You will need a sheet of paper and go to the website [Multiplication with Exponents](#)

2. Complete as many problems as you would like; here is an example.

Simplify. Express your answer using positive exponents.

$$s^7 \cdot s^5$$

To multiply powers with the same base, add their exponents.

Simplify.

$$s^7 \cdot s^5$$

$$s^{7+5}$$ *Multiply the s's, remembering to add the exponents*

$$s^{12}$$

Multiplication Rule Practice:
On a sheet of paper, practice the following problems

1) $2m^2 \cdot 2m^3$

2) $m^4 \cdot 2m^{-3}$

3) $4r^{-3} \cdot 2r^2$

4) $4n^4 \cdot 2n^{-3}$

5) $2k^4 \cdot 4k$

6) $2x^3 y^{-3} \cdot 2x^{-1} y^3$

Multiplication Rule Practice Answer Key:
Once you have completed the problems, check your answers here

1) $2m^2 \cdot 2m^3 = (2\cdot 2)m^{2+3} = 4m^5$

2) $m^4 \cdot 2m^{-3} = 2m^{4+(-3)} = 2m^1 = 2m$

3) $4r^{-3} \cdot 2r^2 = (4\cdot 2)r^{-3+2} = 8r^{-1} = \dfrac{8}{r}$

4) $4n^4 \cdot 2n^{-3} = (4\cdot 2)n^{4+(-3)} = 8n^1 = 8n$

5) $2k^4 \cdot 4k = (2\cdot 4)k^{4+1} = 8k^5$

6) $2x^3y^{-3} \cdot 2x^{-1}y^3 = (2\cdot 2)x^{3+(-1)}y^{-3+3}$
$$= 4x^2y^0$$
$$= 4x^2 \cdot 1$$
$$= 4x^2$$

Division Rule Practice:

1. You will need a sheet of paper and go to the website
2. Complete as many problems as you would like; here is an example.

question

Simplify. Express your answer as a single term, without a denominator.

$$\frac{k^4}{k^4}$$

key idea

To divide powers with the same base, subtract their exponents.

Any number to the zeroth power is equal to one.

solution

Simplify.

$$\frac{k^4}{k^4}$$

k^{4-4} Divide the k's, remembering to subtract the exponents

k^0

1        $k^0 = 1$

Division Rule Practice:
On a sheet of paper, practice the following problems

21) $\dfrac{r^2}{2r^3}$

22) $\dfrac{x^{-1}}{4x^4}$

23) $\dfrac{3n^4}{3n^3}$

24) $\dfrac{m^4}{2m^4}$

25) $\dfrac{3m^{-4}}{m^3}$

26) $\dfrac{2x^4y^{-4}z^{-3}}{3x^2y^{-3}z^4}$

Division Rule Practice Answer Key:
Once you have completed the problems, check your answers here

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

$$\frac{x^{-1}}{4x^4} = \frac{1}{4}x^{-1-4} = \frac{1}{4}x^{-5} = \frac{1}{4x^5}$$

$$\frac{3n^4}{3n^3} = \frac{3}{3}n^{4-3} = 1n^1 = n$$

$$\frac{m^4}{2m^4} = \frac{1}{2}m^{4-4} = \frac{1}{2}m^0 = \frac{1}{2}\cdot 1 = \frac{1}{2}$$

$$\frac{3m^{-4}}{m^3} = 3m^{-4-3} = 3m^{-7} = \frac{3}{m^7}$$

$$\frac{2x^4y^{-4}z^{-3}}{3x^2y^{-3}z^4} = \frac{2}{3}x^{4-2}y^{-4-(-3)}z^{-3-4}$$

$$= \frac{2}{3}x^2y^{-1}z^{-7}$$

$$= \frac{2x^2}{3yz^7}$$

Multiplication & Division Rules Additional Practice:
Click on the links below to get additional practice and to check your understanding.

[Multiplication & Division of Exponents](#) IXL Practice

[Multiplication Rule Teacher Notes](#)

[Multiplication Rule Practice](#) Worksheet & [Answer Key](#)

[Division Rule Teacher Notes](#)

[Division Rule Practice](#) Worksheet & [Answer Key](#)