

Standards addressed in this unit

5. Exponents and Radicals
 - a. Combine terms with integer exponents using exponent properties
 - b. Reduce terms with integer exponents using exponent properties

Math Practice Targets

Make sense of problems and persevere in solving them.

Model with mathematics.

Attend to precision.

Understand Algebraic vocabulary: Term, Coefficient, Variable, Exponent, Factor, Product

I can identify the factors of terms. I can write numbers using exponents

I can multiply terms that contain exponents.

Bell Work

Martha wrote three consecutive positive odd integers on a paper. She then multiplied the first by 2, the second by 3 and the third by 4. The sum of the six integers was 400. What's the smallest integer that she wrote?

Term

Parts of an expression or series separated by + or -

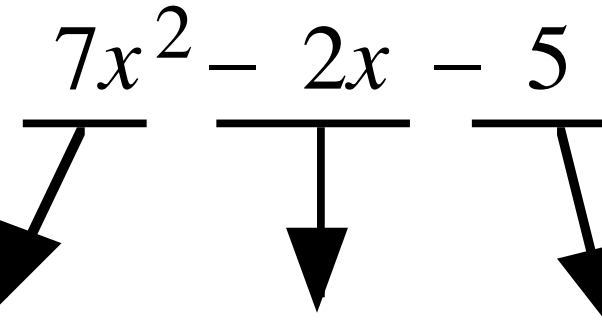
Expression: $5a^3 + 3y^2$

Terms: $5a^3$
 $3y^2$

Another Example

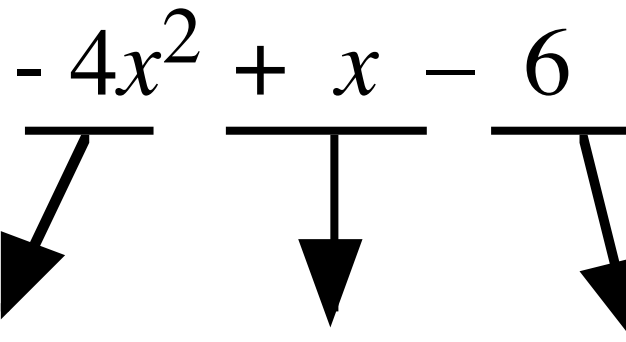
U3D1

Expression:

$$\frac{7x^2}{\quad} - \frac{2x}{\quad} - \frac{5}{\quad}$$


Terms: $+ 7x^2$ $- 2x$ $- 5$

Expression:

$$\frac{-4x^2}{\quad} + \frac{x}{\quad} - \frac{6}{\quad}$$


Terms: $- 4x^2$ $+ 1x$ $- 6$

Identify the terms in the following expressions

$$2a^4 + 30y^2$$

$$9a^2 - 35y^2 - 34$$

Coefficient

A numerical or constant quantity placed before and multiplying the variable in an algebraic expression

Exponent

A number indicates the operation of repeated multiplication of the base.



You try....

U3D1

Term	Coefficient	Variable(s)	Exponent(s)
$3y^4$			
-4			
$-2c$			
$-m^2p^5$			
d^5			
w			

What's a factor?

U3D1

Factor

the numbers or variables used to create a product

What are the factors of:

80

125

$5a^3$

w^3

Exponents

U3D1

How many ways can you write these numbers using exponents?

125

27

81

48

How many ways can you write these variables using exponents?

$xxxxyy$

$nanana$

Simplify: Write out factors then recombine

$$(7y^4)(10y^2)$$

Simplify: Write out factors then recombine

$$5a^4 a^3$$

Simplify: Write out factors then recombine

$$7y^4yz^2yz^3$$

U3D1

Independent Practice

ICP GM U3D1

Day 2

I can substitute values for variables
and follow order of operation rules

I can divide terms that contain exponents
and attend to precision

Problem Solving

If $(a^m)^n = a^{18}$, where m and n are positive integers greater than 1, and $m < n$, find two possible sets of values of m and n .

Solve for p, n if $9a^n a^3 = 3^p a^7$

Evaluating expressions using given replacement values

$$y^2 + 5y$$

Replace y with 6.

$$mp + 5p$$

Replace p with -4
and m with 9.

$$a + ar$$

Replace a with 5
and r with -8.

Substitute and evaluate

U3D2

Let $h = 3$, $p = 2\frac{1}{2}$, $x = 2$, $y = -3$

$$2h + 3h + 6h$$

$$4p + p$$

$$5xy^2 - 6xy^2$$

Simplify

$$(2a^2b)(4ab^2)$$

Simplify

$$2. e \cdot e^2 \cdot e^3 \cdot e^4 \cdot e^5 =$$

$$4. (3xy^2)(2x^2y^3) =$$

Dividing terms that have exponents

Simplify the coefficients, then expand and reduce the exponents

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

$$\frac{8x}{2x^4}$$

Practice

$$\frac{b^3}{6b^4}$$

$$\frac{6x^2}{7x^4}$$

$$\frac{5v}{5v^2}$$

$$\frac{8r^3}{6r^3}$$

Practice a few more

U3D2

$$\frac{6yx^2}{6x^2y^4}$$

$$\frac{8x^5}{2x^5}$$

U3D2

Independent Practice

U3D2 ICP

Day 3

I can simplify terms that contain
Zero exponents.

I can raise a term containing
exponents, to an exponent.

Bell Work

U3D3

Sara bought 8 folders and 3 rulers. Lea bought 8 rulers and 3 folders. Sara paid \$1.25 more than Lea. How much was each folder if each ruler was 45 cents?

Bell Work

U3D3

Evelyn read 25 pages of a book on Friday morning. She read $\frac{1}{4}$ of the remainder on Friday afternoon. If she still had 90 pages to read after Friday afternoon, how many pages were in the book?

Write to explain

Fred said that $(ab)^2$ is the same as ab^2

Do you agree? Why or why not?

When Zero is an exponent

Teach the pattern and why....

Practice applying the exponent rule for Zero exponents

$$n^0$$

$$(3x)^0$$

$$3x^0y$$

$$a^0 + b^0$$

You Try

U3D3

$$3x^0y$$

$$10(mn)^0$$

$$\left(\frac{1}{2b}\right)^0$$

Raise a term to an exponent.

Expand first, then combine terms

$$(4n)^3$$

$$(4v)^2$$

Try a few more

$$(2n^3)^2$$

$$(8x^2)^3$$

A little harder

$$(3x^2y^3)^3$$

$$(-7u^3v^3)^2$$

You practice

U3D3

$$(4yx^4)^2$$

$$(4x^2)^2$$

$$(7mn^2)^3$$

$$(4yx^2)^3$$

Day 4

Problem solving

Review

Quiz U3.1

Write 625 using exponents in as many ways as you can.

Write the following expression with exponents

$$(25)(25)(25)$$

If $(a^m)^n = a^{14}$, where m and n are positive integers greater than 1, and $m < n$, find two possible sets of values of m and n .

Problem Solving

Solve for p, n if $8a^na^3 = 2^pa^5$

Quiz Review

U3D4

Multiply terms with exponents: Combine Terms

$$8v^3 \cdot 4v$$

$$6ba^3 \cdot 7a^3b^2$$

Divide terms with exponents

$$\frac{vu^4}{2u^3}$$

Zero Exponents

$$3x^0y$$

$$\frac{p^2r^0}{p^0r^3}$$

Raising terms with exponents to a power

$$(y^3)^4$$

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

$$(3x^2y^3)^3$$

U3 Q1