

### Algebraic Expressions

1.  $-3(4x - 2) + 5(6x - 3)$

$$\boxed{-12x + 6} + \boxed{30x - 15}$$

$$= 18x - 9$$

2.  $12x + 7y - 18x + 7 - 9 - 4y$

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### Parts of an Expression

3. Identify each term, factor, coefficient, variable, and constant of

$-5x^2 - 2x + 7y + 9$

Term(s)  $-5x^2, -2x, 7y, 9$

Factor(s)  $1, 2, 3, 5, 7, 9, x, x, y$

Coefficient(s)  $-5, -2, 7$

Variable(s)  $x, y$

Constant(s)  $9$

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### Translating & Creating Algebraic Expressions (page 6 of Notes)

7. Twice a number  $2x$

8. 8 more than a third of a number  $8 + \frac{1}{3}x$

6 less than twice k  $2k - 6$

10. Five divided by the sum of a and b.  $\frac{5}{a+b}$

11. The quotient of k decreased by 4 and 9.  $\frac{k-4}{9}$

12. 2 minus the quantity 3 more than p.  $2 - (3+p)$

13. Half of the quantity 1 less than w.  $\frac{1}{2}(w-1)$

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### Creating Algebraic Expressions

The poster below shows the costs at a fall carnival.

**Fall Carnival**

Admission \$10

Each ride \$2

$r = \text{rides}$   
 $2r + 10$

Which of the following expressions represents the total cost, in dollars, of 1 admission and  $r$  rides, for any number of rides?


A.  $10 + 2r$

B.  $10(r + 2) = 10r + 20$

C.  $10 - 2r$

D.  $10 + r + 2$

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INB 

8/30/18      Module 2

**Day 4 & 5 - Properties of Exponents**

Aug 28-1:14 AM

8/28/18

### Essential Question

- How do I simplify and evaluate numeric expressions involving integer exponents?

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Standards: 8/28/18

Use properties of integer exponents to find equivalent numerical expressions. (MGSE8.EE.1)

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Exploring Multiplying Powers			
Original	Expanded Form	Simplified Form	Rule
$x^3 \cdot x^4$	<del>x x x</del> x x x x	$x^7$	Multiplying Powers $x^m \cdot x^n = x^{m+n}$
$x^2 \cdot x^4$	<del>x x</del> x x x x	$x^6$	
$5x^4 \cdot 2x^4$	5 x x x x (2) x x x x	$10x^8$	
$(x^2)^3$	(x x) (x x) (x x)	$x^6$	Power to a Power $(x^m)^n = x^{m \cdot n}$
$(x^3)^2$	(x x x) (x x x)	$x^6$	
$(x^4)^2$	(x x x x) (x x x x)	$x^8$	
$(x^2)^4$	(x x) (x x) (x x) (x x)	$x^8$	
$(2 \cdot 2 \cdot 2)(x \cdot x)(y \cdot y)(z \cdot z)$	(2 2 2) (x x) (y y) (z z)	$16x^2y^2z^2$	Product to a Power $(xy)^m = x^m y^m$
$(2 \cdot 2 \cdot 2)(x \cdot x)(y \cdot y)(z \cdot z)$	(2 2 2) (x x) (y y) (z z)	$8x^2y^2z^2$	
$(10 \cdot 10)(x \cdot x)(y \cdot y)(z \cdot z)$	(10 10) (x x) (y y) (z z)	$100x^2y^2z^2$	
$(5 \cdot 5)(x \cdot x)(y \cdot y)(z \cdot z)$	(5 5) (x x) (y y) (z z)	$25x^2y^2z^2$	

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Exploring Dividing Powers			
Original	Expanded Form	Simplified Form	Rule
$\frac{x^4}{x^1}$	<del>x x x x</del>	$x^3$	Dividing Powers $\frac{x^m}{x^n} = x^{m-n}$
$\frac{x^2}{x^2}$	<del>x x</del>	$x^0 = 1$	
$\frac{2x^4}{4x}$		$\frac{2x^3}{4} = \frac{1}{2}x^3$	
$\frac{6x^3}{2x^2}$		$\frac{6x^3}{2x^2} = 3x$	

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

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Exploring Dividing Powers			
Original	Expanded Form	Simplified Form	Rule
$(\frac{2}{3})^4$	<del>2 2 2 2</del>	$\frac{16}{81}$	Raising a Quotient to a Power $(\frac{x}{y})^m = \frac{x^m}{y^m}$
$(\frac{x}{y})^3$	<del>x x x</del>	$\frac{x^3}{y^3}$	
$(\frac{2x}{y})^2$	(2) (2) (y) (y)	$\frac{4x^2}{y^2}$	
$(\frac{-2x}{y})^3$	(-2) (-2) (-2) (y) (y) (y)	$\frac{-8x^3}{y^3}$	
$\frac{x^0}{x^0}$	<del>x x x</del>	1	Zero Power $\frac{x^m}{x^m} = x^{m-m}$ $x^0 = 1$
$\frac{2^0}{2^0}$		1	
$\frac{x^2}{x^2}$		1	
$\frac{z^1}{z^1}$		1	

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**Negative Exponent**  $a^{-n} = \frac{1}{a^n}$

For any nonzero number "a" raised to a negative exponent, place the power in the denominator to rewrite the power with a positive exponent

WHY?? Let's Explore  $\frac{b^2}{b^5}$  .....

$\frac{bb}{bbbbb} = \frac{1}{bbb} = \frac{1}{b^3}$

$2^{-3} = \frac{1}{2^3} = \frac{1}{2 \cdot 2 \cdot 2} = \frac{1}{8}$        $(-3)^{-3} = \frac{1}{-3 \cdot -3 \cdot -3} = \frac{1}{-27}$

Aug 28-1:13 AM

**8/30/18**

**Post-It**

**Check!**

**Simplify the following:**

1.  $y^3 \times y^6$
2.  $(x^3)^2$
3.  $\frac{b^8}{b^3}$

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1)  $6p^2 \cdot p^3$   $6p^5$   $x^{-1} = \frac{1}{x^1}$  2)  $8r \cdot 6r^4$   $48r^5$

3)  $\frac{8n^2}{5n^4}$   $\frac{8}{5}$  4)  $\frac{7x^4}{5x^4}$   $\frac{7}{5}$

5)  $\frac{u^{-2}v^{-2}}{1}$   $\frac{1}{u^2v^2}$  6)  $5x \cdot (3x^3)^3$   $5x \cdot (3^3)(x^3)(x^3)(x^3)$

7)  $6a^0 \cdot (6a^3)^3$   $(6^1)(6a^3)(6a^3)(6a^3)$   $5 \cdot 3 \cdot 3 \cdot 3$   $135x^9$

$1296a^9$

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Day 4 & 5 - Properties of Exponents

1. Directions: Simplify each expression.

a.  $x^2 \cdot x^3$  b.  $y^4 \cdot y^3$  c.  $n^4 \cdot n^2$  d.  $x^2y^3 \cdot x^2y^4$

e.  $a^3b^4 \cdot ab^2$  f.  $7y^2z \cdot 2yz^2$  g.  $3mn^3 \cdot 8m^2n^4$  h.  $9b^4 \cdot 2a^3 \cdot ab^2$

2. Directions: Simplify each expression.

a.  $(x^2)^3$  b.  $(n^4)^3$  c.  $-(m^2)^4$  d.  $(3x^2y)^4$

e.  $(-5y^2z)^2$  f.  $(-4mn^2)^2$  g.  $(2ab^3)^4$  h.  $(-2x^3y^4)^2$

$(-5^2)(y^2)^2(z^2)^2$

$(-5y^2z^2)(-5y^2z^2)(-5y^2z^2)$

$-125y^6z^6$

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3. Directions: Simplify each expression:

a.  $\frac{x^2}{x^3}$  b.  $\frac{y^4}{y^2}$  c.  $\frac{a^3}{a^2}$  d.  $\frac{-h^4}{h^3}$

e.  $\frac{-12x^2}{3x^2}$  f.  $\frac{45a^2b^3}{-5a^2b}$  g.  $\frac{24y^6}{4y^2}$  h.  $\frac{10m^2n^3}{2m^2}$

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# The X-Game!!!

Exponent Properties - Practice 8-24-16.ks-ipa

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1st Block				
Ibet X X X X	Christopher X X X X	Kobe X X X X	Tyreek X X X X	Cesar X X X X
Daniel X X X X	Jonathan X X X X	Tavarius x x x x	Bren Den x x x x	Jacob X X X X
Davia X X X X	Tomae X X X X	Dakira X X X X	Nino X X X X	Cameron X X X X
Deanthony X X X X	Gerald X X X X	Xavier X X X X	Nikita X X X X	Brenda X X X X
Naveah X X X X	El'asia X X X X	Ariel X X X X	Jared X X X X	Daniyah X X X X
Charles X X X X				

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Blank area for notes or additional work.

Aug 29-8:03 AM