$3x + 5x + 7 = 8x + 7$ $5(x+3) = 5 \cdot x + 5 \cdot 3$ $= 5x + 15$

Algebra 1 8.2

Multiply a polynomial by a monomial

Solve equations involving the product of a monomial and a polynomial

monomial

→ polynomial

→ distributive property

like terms

$2x^2y^4 \cdot 3xy^5$

$2xxyyyy\,3xyyyyy$

$6x^3y^9$

Whiteboards

5 in a row (if time)

$3na \cdot (2x + 7y)$

Distributive property
Show your process

Example 1 Multiply a Polynomial by a Monomial

Find $-3x^2(7x^2 - x + 4)$.

$-3x^2 \cdot 7x^2 + -3x^2 \cdot -1x + -3x^2 \cdot 4$

$-3xx \cdot 7xx + 3x \times x$

$-21x^4 + 3x^3 - 12x^2$

GuidedPractice

Find each product.

1A. $5a^2(-4a^2 + 2a - 7)$

$5a^2 \cdot -4a^2 + 5a^2 \cdot 2a + 5a^2 \cdot -7$

$5aa \cdot -4aa \quad 5aa \cdot 2a \quad 5aa \cdot -7$

$-20a^4 + 10a^3 + -35a^2$

1B. $-6d^3(3d^4 - 2d^3 - d + 9)$

$=$

$-6d^3 \cdot 3d^4 - 6d^3 \cdot -2d^3 - 6d^3 \cdot -1d$ $-6d^3 \cdot 9$

$-6ddd \cdot 3dddd - 6ddd \cdot -2ddd - 6ddd \cdot -1d + 6ddd \cdot 9$

$-18d^7 + 12d^6 + 6d^4 + -54d^3$

5 in a row (product)
(5-10 min.)

$3y \cdot y = 3y^2$

Example 2 Simplify Expressions

Simplify $2p(-4p^2 + 5p) - 5(2p^2 + 20)$.

Distributive property
Combine like terms

Simplify each expression.

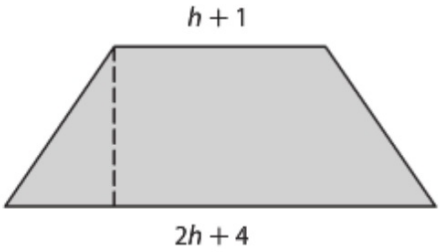
2A. $3(5x^2 + 2x - 4) - x(7x^2 + 2x - 3)$

2B. $15t\left(10y^3t^5 + 5y^2t\right) - 2y\left(yt^2 + 4y^2\right)$

Area of trapezoid...

Standardized Test Example 3 Write and Evaluate a Polynomial Expression

GRIDDED RESPONSE The theme for a school dance is "Solid Gold." For one decoration, Kana is covering a trapezoid-shaped piece of poster board with metallic gold paper to look like a bar of gold. If the height of the poster board is 18 inches, how much metallic paper will Kana need in square inches?



Solve means x=

Example 4 Equations with Polynomials on Both Sides

Solve $2a(5a-2)+3a(2a+6)+8=a(4a+1)+2a(6a-4)+50.$

Distributive property
Like terms
Zero pairs
x=

GuidedPractice

Solve each equation.

4A. $2x(x + 4) + 7 = (x + 8) + 2x(x + 1) + 12$

4B. $d(d+3) - d(d-4) = 9d - 16$

12. $-6(11 - 2c) = 7(-2 - 2c)$

13. $t(2t + 3) + 20 = 2t(t - 3)$