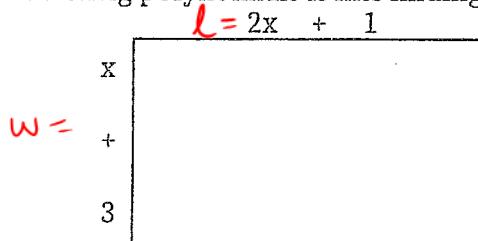


6.7 Multiplying a Monomial by a Polynomial

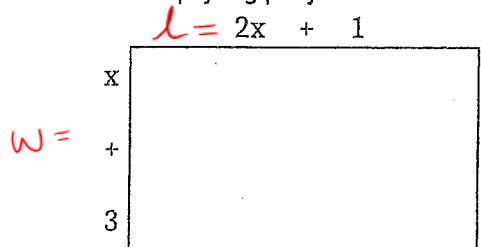
If adding polynomials is like finding the perimeter:



$$\begin{aligned} P &= 2\ell + 2w \\ &= 2(2x+1) + 2(x+3) \\ P &= \textcircled{4x} + 2 + \textcircled{2x} + \textcircled{6} \end{aligned}$$

$$P = 6x + 8$$

Then multiplying polynomials is like finding the area!



$$\begin{aligned} A &= \ell \cdot w \\ &= (2x+1)(x+3) \end{aligned}$$

F.O.I.L.

Multiplying a Monomial by a Monomial:

When doing these types of problems, we multiply or divide the coefficients, then use exponent laws for the variables.

Ex: 1) $\cancel{3}(5x) = 15x$

2) $\cancel{2a}(3b) = 6ab$

3) $\cancel{y}(5y^2) = -5y^3$

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

Try these

$-x(2xy)$	$-2x^2y$
$4x^2(3x^3)$	$12x^5$
$-2y(-1y)$	$2y^2$
$5xy^2(2x^2y^2)$	$10x^3y^4$

Multiplying a Monomial by a Polynomial: \rightarrow Distributive property (Bomb bracket)

Ex: 1) $\cancel{-3}(2x+5) = -3(2x) + -3(5)$

$-6x - 15$

2) $\cancel{-2x}(x-1) = -2x(x) - -2(1)$

$-2x^2 + 2x$

3) $\cancel{3x^2}(x^2+2x-1) = 3x^2(x^2) + 3x^2(2x) - 3x^2(1)$

$3x^4 + 6x^3 - 3x^2$

Dividing Polynomials by Monomials:

When dividing polynomials by monomials, we *divide each term* by the divisor.

Ex: 1) $(3a^2 - 9) \div 3$

$$\begin{array}{r} 3a^2 \\ \hline 3 \\ a^2 - 3 \end{array}$$

Ex: 2) $(12x^3 - 16x^2 + 4) \div (-4x)$

$$\begin{array}{r} 12x^3 - 16x^2 + 4 \\ \hline -4x \\ -3x^2 + 4x - \frac{1}{x} \end{array}$$

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

Try these:

$$\begin{array}{l} -2x^2(-x^3 + 3x^2 - 4x) \\ 2x^5 - 6x^4 + 8x^3 \end{array}$$

$$(16y^4 - 12y^3 + 3) \div 4y^2$$

$$\frac{16y^4}{4y^2} - \frac{12y^3}{4y^2} + \frac{3}{4y^2}$$

$$4y^2 - 3y + \frac{3}{4y^2}$$

$$\frac{3}{4}y^{-2} \quad 0.75y^{-2}$$

Homework: pg. 320 #3, 6-8, 10, 12, 13, 17 + pg 10

Introduction

Simplify the following completely.

Simplify the following completely

1. $(3x)(-2y)(4z)$

1. $2(3x - 4)$

2. $(5a)(5a)$

2. $a(a + 3)$

3. $(-4ab)() = -28ab^2$

3. $-4(a^2 + 3a - 2)$

4. $(6m^2)(3m)$

5. $12ab^2 \times 2a^2b$

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

6. $\frac{14ab}{7a}$

5. $()(3x - 5) = -12x^2 + 20x$

7. $\frac{24xyz}{-8xz}$

6. $(18x^2 - 6x) \div 3x$

8. $() \div -5m = 3m^2$

9. $\frac{-16xy^2}{4xy}$

7. $(8a^3 - 12a^2 + 4a) \div (-4a)$

10. $30p^3q^2 \div -3pq^2$

$$8. \frac{20mn - 5mp + 15m}{5m}$$

$$9. (15x^2 - 9x + 12) \div (\quad) = -5x^2 + 3x - 4$$

$$10. 2(x-3) + 5(x+1)$$

$$11. 4(2x+3) - 2(x-5)$$

Find the area of the triangle below

$$12. A = \frac{bh}{2}$$

