

NEW YORK TIMES BESTSELLER

THE BOOK THAT INSPIRED THE FILM

THE AMERICAN DREAM
AND THE UNTOLD STORY OF
THE BLACK WOMEN MATHEMATICIANS
WHO HELPED WIN THE SPACE RACE

HIDDEN FIGURES



MARGOT LEE SHETTERLY

Book and homework on
your desk.

Read in your novels.



Announcements

- Polynomials test next Thursday
- I will need some time to grade the Exponents Test, thank you for your patience
- Lots of absences the past few weeks - be sure to make a plan with me!
- Hidden Figures Chapter 7 & 8 due Monday
 - I have posted 9, and more will be posted soon so you can work ahead!

Hidden Figures Due Dates

- 7 & 8 due Monday
- 9-12 due March 4
- 13-16 due March 11
- 17-20 due March 18
- 21-23 due March 25 → Book completed!

When we have finished the novel,
we will watch the movie!



Unit Map - Polynomials

~~Thursday - Intro to Polynomials (definitions and degrees) & Adding/Subtracting Polynomials~~

Friday - Multiplying and Factoring

Monday - Multiplying Binomials

Tuesday - Multiplying Special Cases

Wednesday - Polynomials Review

Thursday - Polynomials Test

Homework Check

Adding and Subtracting Polynomials Worksheet

Multiplying and Factoring Polynomials

2/22/2019

Multiplying Monomials with Monomials and Binomials

1

What is the product of the following expressions below?

a) $7x^7(4x^2)$

b) $7x^3(4x^8 + x)$

c) $3x^7(6x^6 + x)$

Multiplying Monomials with other Polynomials

2

Distribute first, then combine "like terms" (same variable, same exponent)

What is the product of each of the following expressions below?

a) $-7x(4x^2 + 7x - 5)$

b) $-2x^3(6x^6 + 7x^4 + x^2)$

c) $4x(5x^3 + 2x^2 - 5x) - 2x^2(7x^2 - x + 8)$

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

Finding the Greatest Common Factor Find the greatest number that divides evenly into the coefficients of each term. Then determine the least exponent for each variable.

3

What is the greatest common factor of $5x^3 + 25x^2 + 45x$?

What is the GCF of the terms of $5x^3 + 25x^2 + 45x$?

List the prime factors of each term. Identify the factors common to all terms.

$$5x^3 = 5 \cdot x \cdot x \cdot x$$

$$25x^2 = 5 \cdot 5 \cdot x \cdot x$$

$$45x = 3 \cdot 3 \cdot 5 \cdot x$$

Remember to list only the prime factors of the variables.

The GCF is $5 \cdot x$, or $5x$.

Find the Greatest Common Factor

$$3x^4 - 9x^2 - 12x$$

Factoring Out A Monomial

What is the factored form of $4x^5 - 24x^3 + 8x$?

To factor the polynomial, first factor each term.

$$4x^5 = 2 \cdot 2 \cdot x \cdot x \cdot x \cdot x \cdot x$$

$$24x^3 = 2 \cdot 2 \cdot 2 \cdot 3 \cdot x \cdot x \cdot x$$

$$8x = 2 \cdot 2 \cdot 2 \cdot x$$

Find the GCF of the three terms.

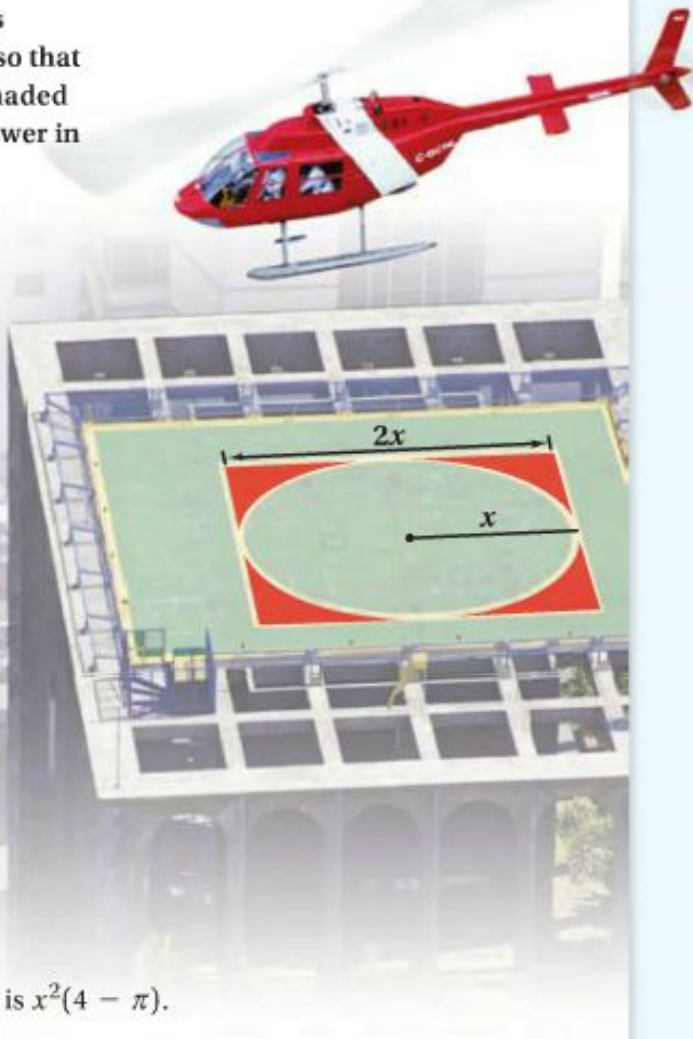
The *GCF* is $2 \cdot 2 \cdot x$, or $4x$.

Factor out the GCF from each term. Then factor it out of the polynomial.

$$\begin{aligned} 4x^5 - 24x^3 + 8x &= 4x(x^4) + 4x(-6x^2) + 4x(2) \\ &= 4x(x^4 - 6x^2 + 2) \end{aligned}$$

$$9x^6 + 15x^4 + 12x^2$$

Helipads A helicopter landing pad, or helipad, is sometimes marked with a circle inside a square so that it is visible from the air. What is the area of the shaded region of the helipad at the right? Write your answer in factored form.



Step 1 Find the area of the shaded region.

$$\begin{aligned}A_1 &= s^2 && \text{Area of a square} \\ &= (2x)^2 && \text{Substitute } 2x \text{ for } s. \\ &= 4x^2 && \text{Simplify.}\end{aligned}$$

$$\begin{aligned}A_2 &= \pi r^2 && \text{Area of a circle} \\ &= \pi x^2 && \text{Substitute } x \text{ for } r.\end{aligned}$$

The area of the shaded region is $A_1 - A_2$, or $4x^2 - \pi x^2$.

Step 2 Factor the expression.

First find the GCF.

$$4x^2 = 2 \cdot 2 \cdot x \cdot x$$

$$\pi x^2 = \pi \cdot x \cdot x$$

The GCF is $x \cdot x$, or x^2 .

Step 3 Factor out the GCF.

$$\begin{aligned}4x^2 - \pi x^2 &= x^2(4) + x^2(-\pi) \\ &= x^2(4 - \pi)\end{aligned}$$

The factored form of the area of the shaded region is $x^2(4 - \pi)$.

Multiplying Binomials – FOIL Method

4

What is the product of the expression $(x - 3)(x + 8)$?

- F _____
– *Multiply the first two terms together*
- O _____
– *Multiply the two outside terms together*
- I _____
– *Multiply the two inside terms together*
- L _____
– *Multiply the last two terms together*

6

What is the product of the following expressions?

a) $(x + 2)(x + 7)$

b) $(3x - 2)(4x + 6)$

c) $(7x^7 + 5x)(4x^2 + 2)$

7

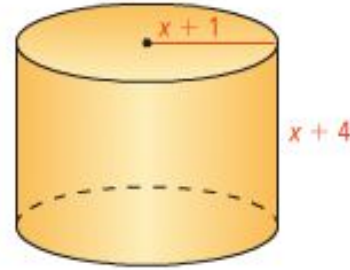
What is the product of the following expressions?

a) $(x + 4)(x + 8)$

b) $(-12x - 4)(6x - 2)$

c) $(x^5 - 3x)(x^3 + 10)$

A cylinder has the dimension shown in the diagram. What polynomial in standard form best describes the total surface area of the cylinder?



The total surface area (S.A.) of a cylinder is given by the formula

S.A. = $2\pi r^2 + 2\pi rh$, where r is the radius of the cylinder and h is the height.

$$\text{S.A.} = 2\pi r^2 + 2\pi rh$$

$$= 2\pi(x + 1)^2 + 2\pi(x + 1)(x + 4)$$

$$= 2\pi(x + 1)(x + 1) + 2\pi(x + 1)(x + 4)$$

$$= 2\pi(x^2 + x + x + 1) + 2\pi(x^2 + 4x + x + 4)$$

$$= 2\pi(x^2 + 2x + 1) + 2\pi(x^2 + 5x + 4)$$

$$= 2\pi(x^2 + 2x + 1 + x^2 + 5x + 4)$$

$$= 2\pi(2x^2 + 7x + 5)$$

$$= 4\pi x^2 + 14\pi x + 10\pi$$

Surface area of a cylinder

Substitute $x + 1$ for r and $x + 4$ for h .

Write $(x + 1)^2$ as $(x + 1)(x + 1)$.

Multiply binomials.

Combine like terms.

Factor out 2π .

Combine like terms.

Write in standard form.

Multiplying Binomials and Trinomials

9

What is the product of the following expressions?

$$(3x^2 + x - 5)(2x - 7)$$

Multiply by arranging the polynomials vertically as shown.

$$\begin{array}{r} 3x^2 + x - 5 \\ \underline{2x - 7} \\ -21x^2 - 7x + 35 \\ \underline{6x^3 + 2x^2 - 10x} \\ 6x^3 - 19x^2 - 17x + 35 \end{array}$$

Multiply by -7 .

Multiply by $2x$.

Add like terms.

The product is $6x^3 - 19x^2 - 17x + 35$.

a. $(x + 1)(x^2 + 3x + 4)$

b. $(x^2 - 4)(x^2 + 6x + 5)$

c. $(x - 3)(x^2 - 5x - 7)$

Homework

Multiplying Polynomials Worksheet (16 questions)

Textbook Page 483 #15, 19, 23, 25 (4 questions)

HF through Chapter 8 due Monday