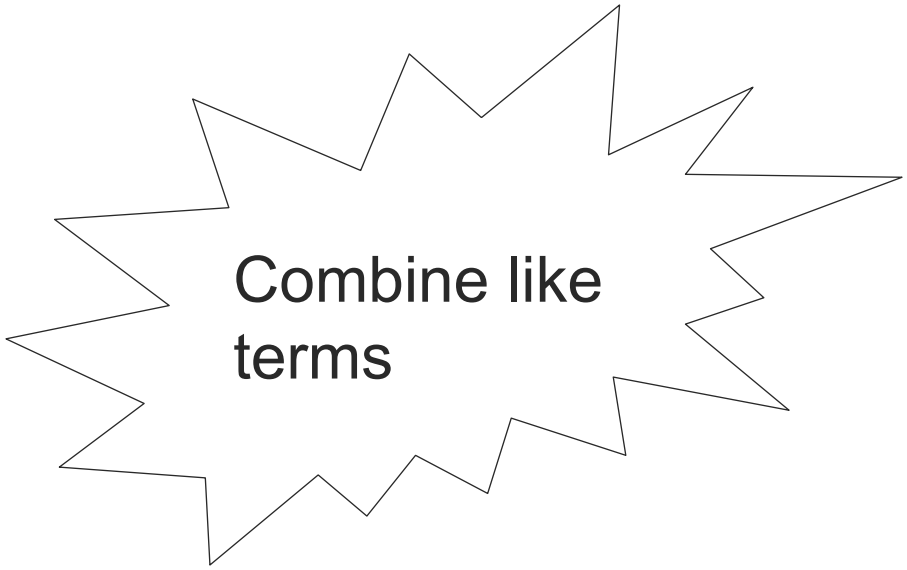
Introduction to Polynomials

- Adding and Subtracting

Simplifying Polynomials

Simplify the following (answers on next page)

1. $5x^2 + 12x^2$
2. $2w^3 – 4w + 3w^3$
3. $-3r^3 + 5r^3 – 8r^3$
4. $14x – 9$



Simplifying Polynomials

Simplify the following (answers on next page)

1. $5x^2 + 12x^2 = 17x^2$
2. $2w^3 – 4w + 3w^3 = 5w^3 – 4w$
3. $-3r^3 + 5r^3 – 8r^3 = -6r^3$
4. $14x – 9 = 14x – 9$ (already simplified)

Adding Polynomials

- Combine like terms
- Order exponents from greatest to least

$$(3x^3 - 4x^2 + 5x) + (4x^4 - 4x^3 - 3x^2 - 2x)$$

$$= 4x^4 + 3x^3 - 4x^3 - 4x^2 - 3x^2 + 5x - 2x$$

$$= 4x^4 - x^3 - 7x^2 + 3x$$

Adding – Try on your own

- Try these. The answers are on the next slide.
- Remember to combine like terms and to put the exponents in the proper order.
- $(4x^2 – 3x^3 + 3) + (2x^2 – 2x^3 – 3)$
- $(15x^4 – 4x^2 – 1) + (4x^4 + 3x^3 + 2x^2 – 2)$

Try on your own – Answers

- $(4x^2 – 3x^3 + 3) + (2x^2 – 2x^3 – 3) =$

$-5x^3 + 6x^2$

  - The exponents are in the proper order
  - Remember that -3 + -2 is -5

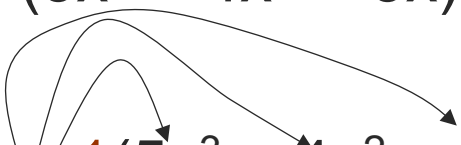
- $(15x^4 – 4x^2 – 1) + (4x^4 + 3x^3 + 2x^2 – 2) =$

$19x^4 + 3x^3 – 2x^2 – 3$

  - There's only one term with an exponent of 3
  - -4 + 2 = -2

Subtracting Polynomials (cont.)

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



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

- Here, -1 is multiplied by every term
- So, -1(5) and -1(-4) and -1(5)

$= 6x^3 - 2x^2 - x - 5x^3 + 4x^2 - 5x$

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

Distributive Property!

Subtracting – Try on your own

- Put a 1 in front of the ( ) that is being subtracted.
- Use the distributive property

- $(4x^5 – 3x^4 – x + 4) – (3x^5 – 2x – 2)$
- $(10z^3 – 2z^2) – (4z^3 – 6z^2)$

Try on your own – Answers

- $(4x^5 - 3x^4 - x + 4) - (3x^5 - 2x - 2)$

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

$= 4x^5 - 3x^4 - x + 4 - 3x^5 + 2x + 2$

$= x^5 - 3x^4 + x + 6$

- $(10z^3 - 2z^2) - (4z^3 - 6z^2)$

$= (10z^3 - 2z^2) - 1(4z^3 - 6z^2)$

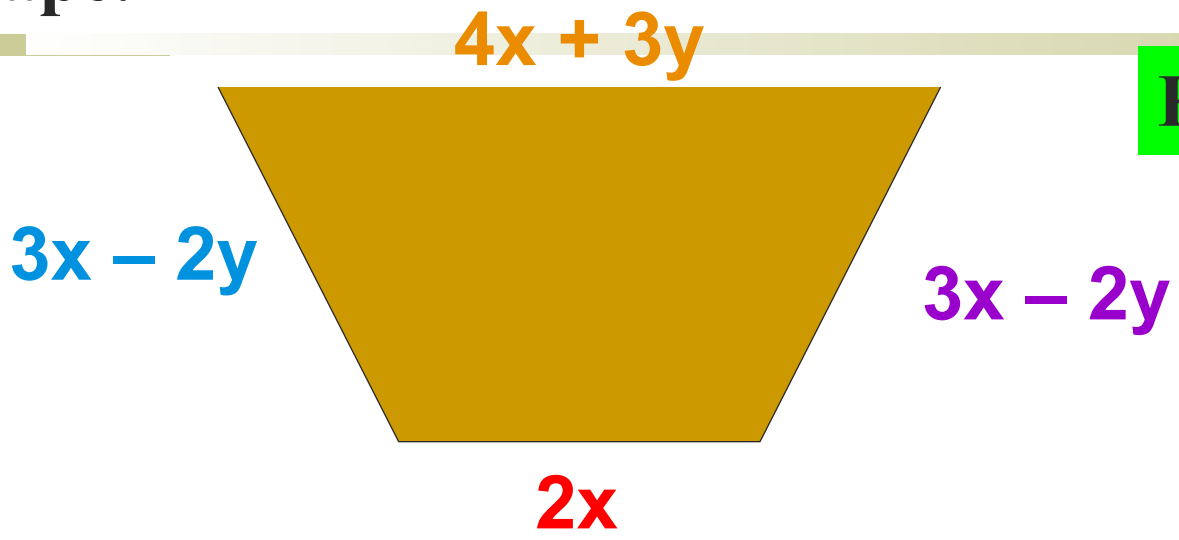
$= 10z^3 - 2z^2 - 4z^3 + 6z^2$

$= 14z^3 + 4z^2$

Real World Problems

- Perimeter is when you add up all of the side of figure.
- When you talk about a total, you need to add.
- When you talk about the profit it is a gain.
- When you talk about a loss, you need to subtract.
- When looking at Algebra titles you need to just combine the same size titles

In algebraic terms, find the perimeter of the following shape.



Key Skills

To find the perimeter, add the sides together.

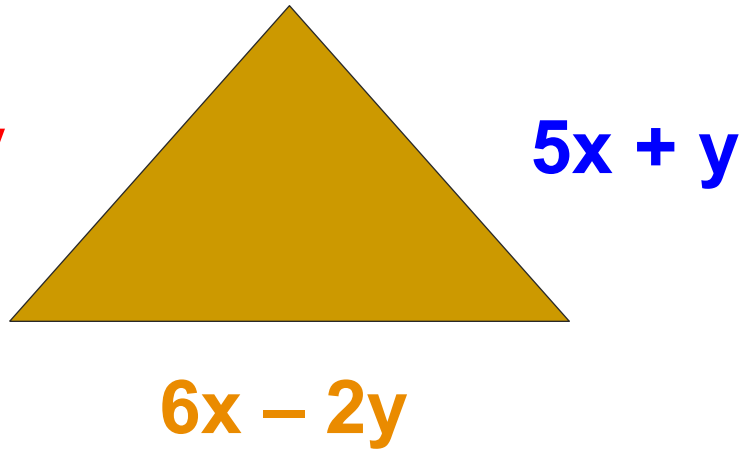
$P = 3x - 2y + 2x + 3x - 2y + 4x + 3y = 12x - y$

What is the perimeter if x = 5 and y = 8?

$P = 12(5) - 8 = 52$

Find the perimeter of the following shape when x = 2.

TRY THIS



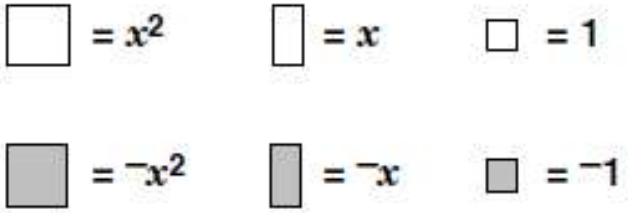
To find the perimeter, add the sides together.

$P = 5x + y + 5x + y + 6x - 2y = 16x = 32$

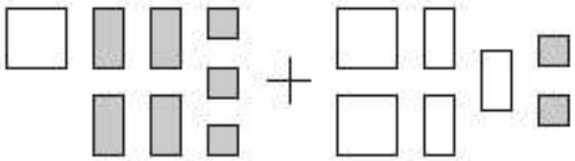
Does the value of y matter in this problem? Obviously Not!

Try this one

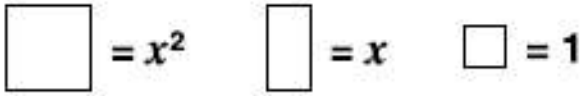
Consider the following models.



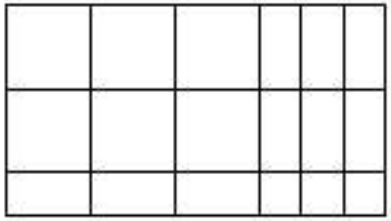
What polynomial is represented by the following?



F $3x^2 - x - 5$
G $3x^2 - 7x - 5$
H $3x^2 + 7x - 5$
J $3x^2 + x - 5$



Consider the models above.

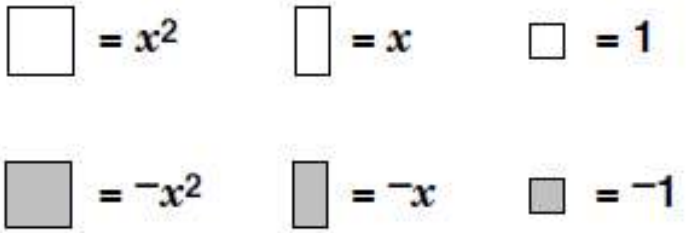


What polynomial is represented by this diagram?

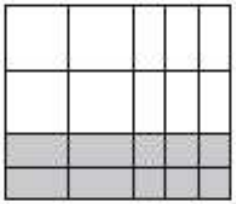
A $6x^2 + 12x$
B $2x^2 + 3x + 1$
C $6x^2 + 9x + 3$
D $9x^2 + 6x + 3$

A few more

Consider the following models



What polynomial is represented by this diagram?



F $4x^2 - 10x - 6$
G $4x^2 - 2x - 6$
H $4x^2 + 2x - 6$
J $4x^2 + 10x + 6$

A local fast food chain had revenue represented by the polynomial $6x^2 + 5x - 8$ for one fiscal year and expenses for that same fiscal year represented by the polynomial $4x^2 - 3x + 7$. What was the company's profit for the fiscal year?

More Word Problems

- Sherry owned a card shop and an art store. The card shop profits for 1998 are represented by the polynomial $3x^2 + 5x + 8$. The art shop however had losses for 1998 represented by the polynomial $2x^2 - 8$. Which polynomial represents the total amount Sherry made in 1998?

What is the perimeter of a square with a side of length 3x - 1?

A rectangle's length is 5x - 2 and width 2x - 1. What is the perimeter of the rectangle?