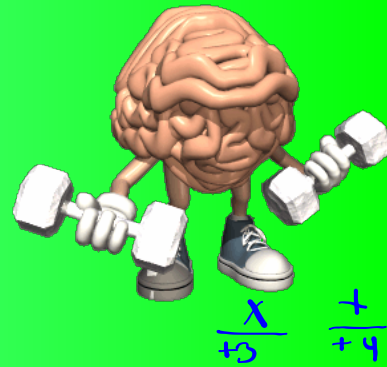


Warm Up



Hand in For Marks

1) $20 - 32a + 40a^3$
 $4(5 - 8a + 10a^3)$



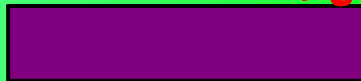
2) $x^2 + 4x + 3$
 $(x + 3)(x + 1)$



3) $-42k + 36k^2 + 30k^3$



4) $5x^2 - 45x + 70$
 $5(x - 7)(x - 2)$
Below



5) $4n^2 + 21n - 18$
 $(n + 6)(4n - 3)$

3) $10n^2 - n - 24$
 $\frac{x}{-240} \quad \frac{+}{-1}$
 $+15 \cdot 16$



$10n^2 + 15n - 16n - 24$
 $5n(n+3) - 8(2n+3)$
 $(2n+3)(5n-8)$

7) $49x^4 - 4$



8) $x^2 + 100$ *not dir*

will not factor

Can't factor

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

4) $5x^2 - 45x + 70$
 $5(x^2 - 9x + 14)$
 $5(x - 7)(x - 2)$

Homework Solutions

none

Prime Numbers

2, 3, 5, 7, 11, 13, ..

Prime Numbers

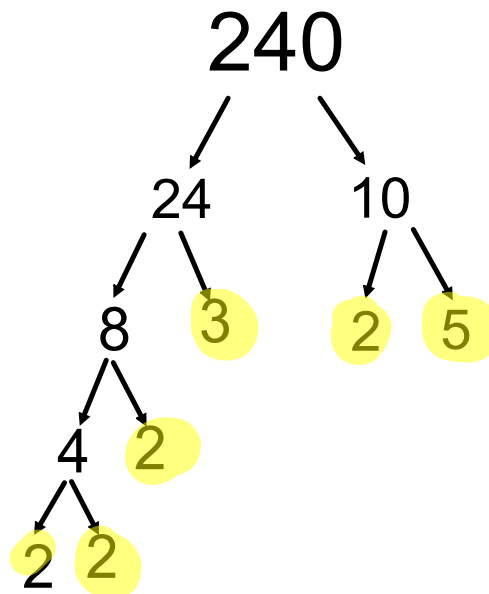
A Prime Number can be divided evenly **only** by 1 & itself.
And it must be a whole number greater than 1.

The first few prime numbers are 2, 3, 5, 7, 11, 13, 17 etc.....

Determining the Prime Factors of a Whole Number

Write the prime factorization of 240

Draw a Factor
Tree !!



The Prime Factorization of 240 is:

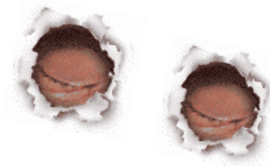
$$2 \times 2 \times 2 \times 3 \times 5 \times 2 \quad \text{or} \quad 2^4 \times 3 \times 5$$

The Prime Factors of 240 are:

2, 3, & 5



Warm Up



What is the greatest common factor of 144 and 216 ?

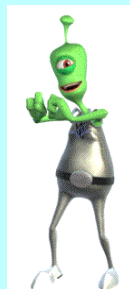
What is the least common multiple of 45 and 30 ?

Distributing Factor

3.7 Multiplying Polynomials

Expand & Simplify

Rainbow



Expand and collect like terms.

$$2x(5x+3) - 7x(6x-5)$$

$$10x^2 + 6x - 42x^2 + 35x$$

$$10x^2 - 42x^2 + 6x + 35x$$

$$-32x^2 + 41x$$

$$\overset{\text{top}}{(x + 4)} \overset{\text{side}}{(x - 3)}$$

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

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

$$x^2 + 1x - 12$$

Expand and simplify

$$\begin{aligned} & (x-3)(x-1)(x-5) \\ &= (x^2 - 1x - 3x + 3)(x-5) \\ &= (x^2 - 4x + 3)(x-5) \\ &= x^3 - 5x^2 - 4x^2 + 20x + 3x - 15 \\ &= x^3 - 9x^2 + 23x - 15 \end{aligned}$$

$$(2x+3)(4x+7) + (2x+2)(x-3)$$

Factoring

There are 5 different kinds of Factoring:

- **Greatest common factor (GCF)**
- **Simple Trinomials (Factor by Inspection)**
- **Hard Trinomials (Factor by Decomposition)**
- **Special Factors**
 - **Difference of Squares**
 - **Perfect Square Trinomials**

Simple Trinomials

- has three terms with the form...

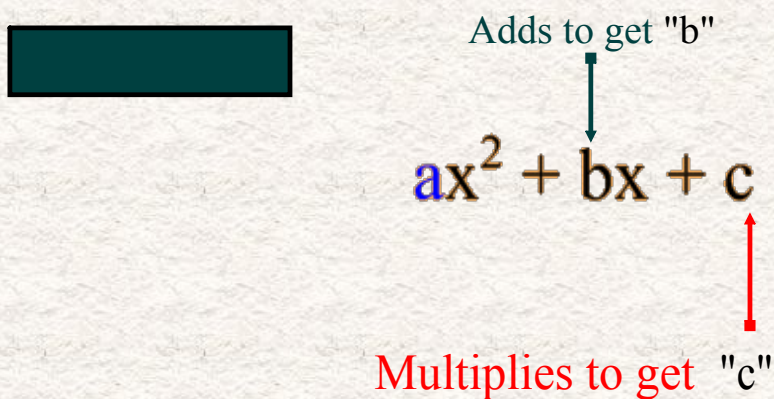
$$ax^2 + bx + c$$

- a simple trinomial has an "a" value of 1.
- we use a method of inspection to factor them.

CHECK IT OUT!!!

INSPECTION METHOD

- here's how it goes... "What two numbers?"

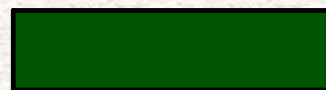


EXAMPLES...

SOLUTIONS

multiply add

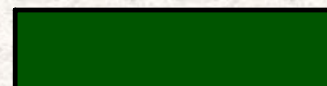
1) $x^2 + 13x - 48$



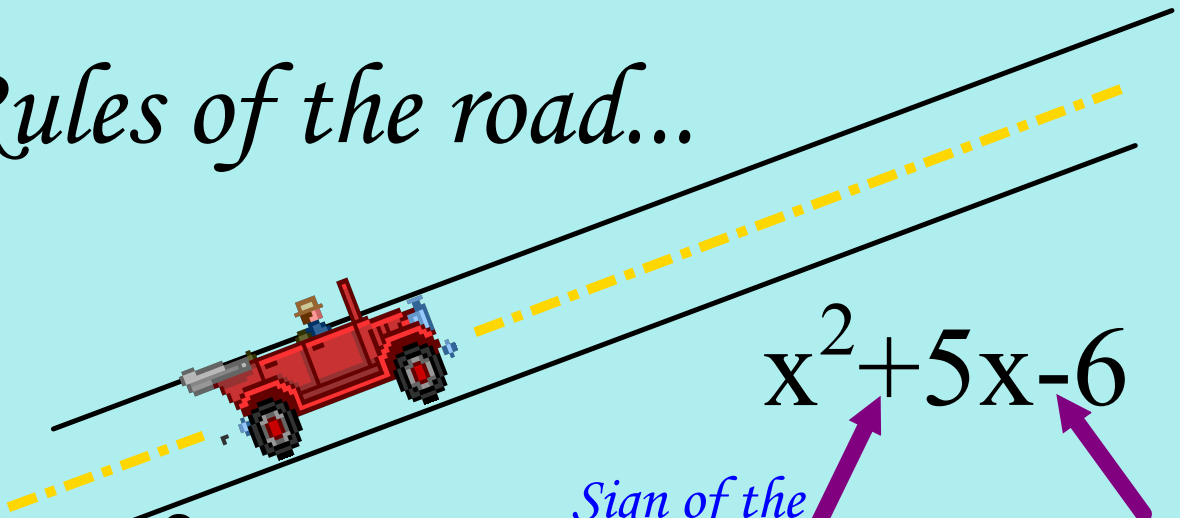
2) $x^2 - 10x - 24$



3) $2x^2 - 20x + 42$



Rules of the road...



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

*Sign of the
biggest number.*

*Signs are
the same.*

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

*Sign of the
biggest number.*

*Signs are
different.*

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

Hard Trinomials

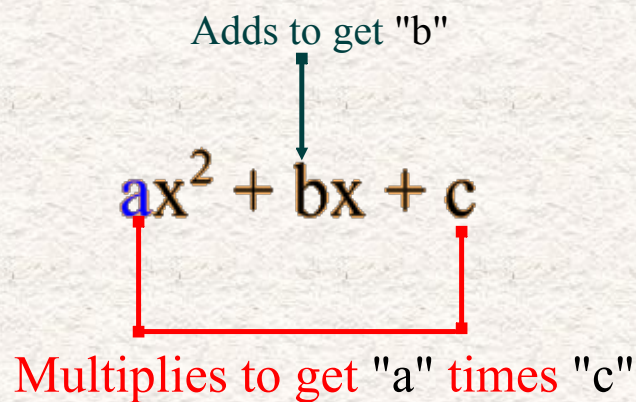
- has three terms with the form...

$$ax^2 + bx + c$$

- a hard trinomial has an "a" value **not equal to 1**.
- we use a method of decomposition to factor them.

DECOMPOSITION METHOD

- here's how it goes... "What two numbers?"



- once you find the two numbers, use them to break the MIDDLE TERM into two pieces (decomposition).
- then, factor by grouping.

Factor Completely!

1. $2x^2 + 5x + 3$ $\frac{x}{6}$ $\frac{+}{+3}$

$$2x^2 + 2x + 3x + 3$$

$$2x(x+1) + 3(x+1)$$

$$(x+1)(2x+3)$$

I think I need
to use decomposition!



Factor

$$4x(x-1) - 7(x-1)$$

$$(x-1)(4x-7)$$


last question test


Difference of Squares


- two terms that are perfect squares.
- must be a difference
- factor like this...


$$a^2 - b^2 = (a + b)(a - b)$$

EXAMPLES...

1) $4x^2 - 49$


2) $16x^2 - 9y^2$


3) $81z^4 - 625$


4) $49w^2 - 4s^2$


$$49x^2 - 64y^2$$

$$(7x - 8y)(7x + 8y)$$

$$\left. \begin{array}{l} \text{GCF } 32n^2 - 50 \\ 2(16n^2 - 25) \\ \underbrace{\hspace{10em}}_{\text{diff of sq}} \\ 2(4n-5)(4n+5) \\ \textcircled{1} \quad \textcircled{1} \quad \textcircled{1} \end{array} \right\}$$

Perfect Square Trinomials

- three terms: the first and last are perfect squares.
- factors like this...

$$a^2 + 2ab + b^2 = (a + b)^2$$

OR

$$a^2 - 2ab + b^2 = (a - b)^2$$

- recognize them and you save yourself the decomposition steps!!!

EXAMPLES...

1) $25x^2 - 10x + 1$



2) $9x^2 + 24x + 16$



Hand in For Marks

1) $20 - 32a + 40a^3$

2) $x^2 + 4x + 3$

3) $-42k + 36k^2 + 30k^3$

4) $5x^2 - 45x + 70$

5) $4n^2 + 21n - 18$

6) $10n^2 - n - 24$

Review Questions

1. $9x^2 - y^2$

2. $2x^2 - x - 15$

3. $3a^2b^2 + 27a^4b^7 - 12a^6b^5$

4. $3x^2 - 27x + 42$

5. $24x^4 + 10x^2 + 4$

Tricky

6. $(x+1)^2 - (x+5)^2$

Factoring Review

Math 10B

Factor each completely :

1) $6b^2a^2 - 24b^2$

2) $3x^2 + x - 10$

3) $x^2 - 4y^2$

4) $m^2 - 10m - 11$

5) $25x^2 - 30x + 9$

6) $2n^2 - 9n + 9$

7) $15x^2 - 12y^2$

8) $2a^2 - 7a^2 - 20a + 70$

9) $4x^2 + 100xy + 625y^2$

10) $36n^2 - 32$

11) $a^2 - 9a - 36$

12) $6v^3 - 48v - 2v^2 + 16$

13) $-56x^3 + 80$

14) $9m^4 + 30m^2n^2 + 25n^4$

15) $5v^2 - 26v - 63$

16) $64x^2 - 36y^2$

17) $2x^2 - 2x - 40$

18) $4x^2 - 25$

19) $3x^2 - 17xy + 10y^2$

20) $40x^3 - 5x^2 - 32x + 4$

21) $25r^2 - 49$

22) $p^2 - 5p - 84$