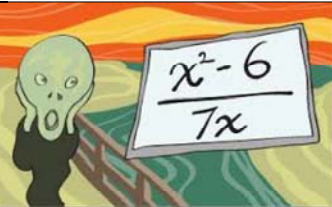



2.0 Factoring Review.notebook



Unit 2: Rational Expressions and Equations



2.0 Factoring Review and The Quadratic Formula

The main skill you must have in order to be successful in Rationals is factoring. There are only two methods of factoring you need to know. They are:

Difference of Squares

Ex.) $\sqrt{4x^2} - \sqrt{25}$

$= (2x+5)(2x-5)$

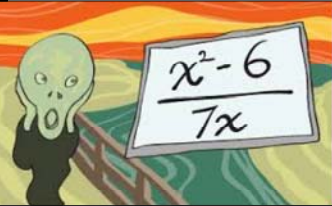
Greatest Common Factor

Ex.) $\frac{\cancel{3}x^3}{\cancel{3}x^2} - \frac{27\cancel{x}^2}{3\cancel{x}}$


$= 3x^2(x-9)$

* try to GCF first.

Feb 9-7:52 AM



Greatest Common Factor



Ex. 1) $15w^4 + \cancel{5w^4} - 25w^3$

$\frac{5w^4}{5w^2} \quad \frac{5w^4}{5w^2} \quad \frac{25w^3}{5w^2}$

$= 5w^2(3w^2 + 1 - 5w)$

Ex. 2) $\frac{18x^4}{6x^2} + \frac{24x^3}{6x^2} - \frac{54x^3}{6x^2}$

$= 6x^2(3x^2 + 4 - 9x)$

Ex. 3) $x^2 - \cancel{x^1}$

$\frac{x^2}{x^1} \quad \frac{x^1}{x^1}$

$= x(x-1)$

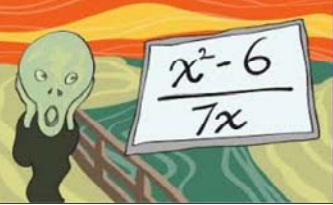


Ex. 4) $\frac{-2x^3}{-2x^2} + \frac{16x^2}{-2x^2}$

$= -2x^2(x-8)$

Note: Factoring out a GCF is ALWAYS the first thing you check for.

Feb 9-8:02 AM

2.0 Factoring Review.notebook

Difference of Squares

Ex. 1) $x^2 - 25$

$$= (x-5)(x+5)$$

2) $4x^2 - 49$

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

3) $\frac{4x^2}{4} - \frac{16}{4} = (2x+4)(2x-4)$

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

$$= 4(x+2)(x-2)$$

4) $4x^2 - 9$

$$= (2x+3)(2x-3)$$

5) $\frac{16x^4}{16} - \frac{64y^2}{16}$

$$= 16(x^4 - 4y^2)$$

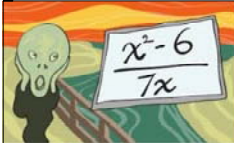


$$= 16(x^2+2y)(x^2-2y)$$

6) $\frac{wy^2}{x} - \frac{xz^2}{x}$

$$= x(wy^2 - xz^2)$$

$$= x(wy+xz)(wy-xz)$$

Feb 9-8:03 AM

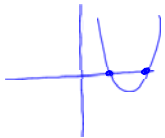




The Quadratic Formula: Used to solve for x in a trinomial algebraically.

Quadratic equations

For $ax^2 + bx + c = 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$



Ex. $x^2 + 6x + 5$

a b c

$$x = \frac{-6 \pm \sqrt{(-6)^2 - 4(1)(5)}}{2 \cdot 1} = \frac{-6 \pm \sqrt{16}}{2}$$

$$= \frac{-6 \pm 4}{2}$$

$$\frac{-6+4}{2}$$

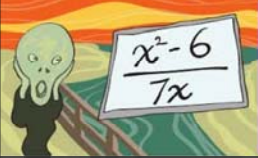

$$x = -1$$

$$\frac{-6-4}{2}$$

$$x = -5$$

Mar 23-8:17 AM

2.0 Factoring Review.notebook

rational
expressions

denominator
restrictions
numerator

Ex.) a) $x^2 + 4x - 1 = 0$
a b c

$$x = \frac{-4 \pm \sqrt{(4)^2 - 4(1)(-1)}}{2 \cdot 1}$$

$$= \frac{-4 \pm \sqrt{20}}{2} \leftarrow \frac{\sqrt{4 \cdot 5}}{2\sqrt{5}}$$

$$= \frac{-4 \pm 2\sqrt{5}}{2}$$

$$= \boxed{-2 \pm \sqrt{5}}$$

$$x = \left(\frac{-4 + \sqrt{20}}{2} \right) = \boxed{0.24}$$

$$x = \left(\frac{-4 - \sqrt{20}}{2} \right) = \boxed{-4.24}$$

b) $x^2 - x + 4 = 0$
a b c


$(-1)^2 - 1 \cdot -1 = 1$

$$x = \frac{-(-1) \pm \sqrt{(-1)^2 - 4(1)(4)}}{2 \cdot 1}$$

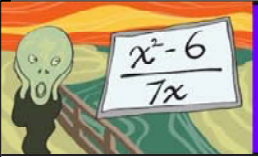

$$= \frac{1 \pm \sqrt{-15}}{2}$$

impossible

\therefore no x-int



Mar 23-8:19 AM

rational
expressions

denominator
restrictions
numerator

c) $x^2 + 4x - 2 = 0$
a b c

$$x = \frac{-4 \pm \sqrt{(4)^2 - 4(1)(-2)}}{2 \cdot 1}$$

$$= \frac{-4 \pm \sqrt{24}}{2} \leftarrow \frac{\sqrt{4 \cdot 6}}{2\sqrt{6}}$$

$$= \frac{-4 \pm 2\sqrt{6}}{2}$$

$$= \boxed{-2 \pm \sqrt{6}}$$

$$x = \boxed{0.45, -4.45}$$

d) $x^2 - 5x + 4 = 0$

$$x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(1)(4)}}{2 \cdot 1}$$

$$x = \frac{5 \pm \sqrt{9}}{2}$$

$$= \frac{5 \pm 3}{2} \left\{ \begin{array}{l} \frac{5+3}{2} = \boxed{4} \\ \frac{5-3}{2} = \boxed{1} \end{array} \right.$$

- Factoring Worksheet
- Quadratic Formula Worksheet

Mar 23-8:20 AM