November 4, 2015

Factoring Special Cases

#8) $a^4 - 9$ → Like $a^2 - b^2$

Difference

$a = (a^2)^2 = a^4$

$b = (3)^2 = 9$

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

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#10) $1 - r^2$ (a^2, b^2)

$a = (1)^2 = 1$

$b = (r)^2 = r^2$

$(1+r)(1-r)$

$1 - r + r - r^2$

$1 - r^2$

$r^2 - 1$

$a = (r)^2 = r^2$

$b = (1)^2 = 1$

$(r+1)(r-1)$

$r^2 - r + r - 1$

$r^2 - 1$

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#15) $10m^2 + 100m + 250$

* Does this have a GCF other than one? If so, factor out first.

$10(m^2 + 10m + 25)$ $ac = 25$, $b = 10$

+	+
5	5

$10(m^2 + 5m + 5m + 25)$

$10(m(m+5) + 5(m+5))$

$10(m+5)(m+5)$

or

$10(m+5)^2$

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Solving using Factoring

#3) $(4k+5)(k+1) = 0$

① $4k + 5 = 0$

$\frac{4k}{4} = \frac{-5}{4}$

$k = -\frac{5}{4}$

② $k + 1 = 0$

$k = -1$

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#8) $m^2 + 3m - 12 = 6$

$-6 \quad -6$

not yet set equal to zero.

$m^2 + 3m - 18 = 0$ $ac = -18$, $b = 3$

+	−
6	3

$m^2 + 6m - 3m - 18 = 0$

$m(m+6) - 3(m+6) = 0$

$(m+6)(m-3) = 0$

① $m + 6 = 0$

$m = -6$

② $m - 3 = 0$

$m = 3$

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Sets of Numbers

Rational $\left\{ \frac{a}{b} \mid a \text{ \& } b \text{ are Integers such that } b \neq 0 \right\}$

Integers $\{\ldots, -2, -1, 0, 1, 2, \ldots\}$

Whole

Natural → $\{1, 2, 3, \ldots\}$

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Set - Builder Notation

$S = \{ x \mid \text{what} \}$ (such that)

Rational Numbers $= \left\{ \frac{a}{b} \mid a \& b \text{ are Integers and } b \neq 0 \right\}$ (Fraction!)

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Rational Numbers

* Are fractions!

$\frac{1}{2}, -\frac{3}{4}, 0.25, -66\%, \frac{5}{1}, -\frac{13}{1}$

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Rational Polynomials

① Simplify

* Always factor if possible

$$\frac{12}{v^3} \cdot \frac{v^4}{10} = \frac{6v}{5}$$

$$\frac{2 \cdot 2 \cdot 3}{v \cdot v \cdot v} \cdot \frac{v \cdot v \cdot v \cdot v}{2 \cdot 5} = \frac{2 \cdot 3}{1} \cdot \frac{v}{5} = \frac{6v}{5}$$

(each $= 1$)

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