

# Mixed Review of Factoring

## Key

Algebra 2 - Unit 5 Rational Functions

### GCF Practice

Cut out four of the problems below to factor. Once factored, glue them into your notebook under the heading "Greatest Common Factor."

$7x^2 - 28x$ $7x(x-4)$	$5x^3 + 15x^2 + 10x$ $5x(x^2 + 3x + 2)$ <del><math>5x^2</math></del> $5x(x+2)(x+1)$	$9x^2 - 6x + 63$ $3(3x^2 - 2x + 21)$ <del><math>9x^2</math></del> $3(x-3)(3x+7)$	$15x^2 + 5x - 105$ $5(3x^2 + x - 21)$
$16x^3y - 24x^2y + 32xy$ $8xy(2x^2 - 3x + 4)$	$20a^2y + 12ay - 6y$ $2y(10a^2 + 6a - 3)$	$72p^3 + 63p^2 - 36q$ $9(8p^3 + 7p^2 - 4q)$	$15x^4 - 27x^3y - 6x^2y^2$ $3x^2(5x^2 - 9xy - 2y^2)$
$8x^4 + 56x^3 + 98x^2$ $2x^2(4x^2 + 28x + 49)$ <del><math>14x</math></del> <del><math>7x</math></del> $2x^2(2x+7)^2$	$35a^2 - 100a - 15$ $5(7a^2 - 20a - 3)$ <del><math>21a</math></del> <del><math>-20a</math></del> $5(x-3)(7x+1)$	$36k^3 - 64k$ $2k(18k^2 - 32)$ $4k(9k^2 - 16)$	$x^4 + x^3 - 56x^2$ $x^2(x^2 + x - 56)$ <del><math>8x</math></del> <del><math>-7</math></del> $x^2(x+8)(x-7)$
$2ax^2 - 22ax + 60a$ $2a(x^2 - 11x + 30)$ <del><math>5x^2</math></del> <del><math>-11x</math></del> $2a(x-5)(x-6)$	$3x^3 + 21x^2 + 30x$ $3x(x^2 + 7x + 10)$ $3x(x+5)(x+2)$	$24a^3y + 18a^3y^2 - 30a^2y^2$ $6a^2y(4a + 3ay - 5y)$	$14b^5c^2 + 16b^3c^5 - 8b^4c^3$ $2b^3c^2(7b^2 + 8c^3 - 4bc)$

## Difference of Two Squares, Two Cubes or Sum of Two Cubes Practice (Station #2)

Cut out four of the problems below to factor. Once factored, glue them into your notebook under the heading "Difference of Two Squares."

$4x^2 - 9$  $(2x+3)(2x-3)$	$49x^2 - 16$  $(7x+4)(7x-4)$	$64x^3 + z^3$ $a=4x \quad b=z$ $(4x+z)(16x^2 - 4xz + z^2)$	$x^4 - y^2$  $(x^2+y)(x^2-y)$
$64x^3 + 125$ $a=4x \quad b=5$ $(4x+5)(16x^2 - 20x + 25)$	$121a^2 - 81y^2$ $(11a+9y)(11a-9y)$	$27x^3 - 125$ $a=3x \quad b=5$ $(3x-5)(9x^2 + 15x + 25)$	$16p^2 - 64q^2$ $(4p+8q)(4p-8q)$
$8x^3 - 1$ $a=2x \quad b=1$ $(2x-1)(4x^2 + 2x + 1)$	$1 - k^3$ $a=1 \quad b=k$ $(1-k)(1+k+k^2)$	$3m^3 - 81$ GCF: 3 $3(m^3 - 27)$ $a=m \quad b=3$ $3(m-3)(m^2 + 3m + 9)$	$100 - a^4y^2$ $(10+a^2y)(10-a^2y)$
$49y^2 - z^2$  $(7y+z)(7y-z)$	$15x^3 + 5$ GCF: 5 $5(3x^3 + 1)$ not a perfect cube	$25a^2 - 49$  $(5a+7)(5a-7)$	$144x^2y^2 - 9$ $(12xy+3)(12xy-3)$

## Factoring Trinomial Practice

Cut out four of the problems below to factor. Once factored, glue them into your notebook under the heading "Factoring Trinomials."

'Bottoms Up' Method

$4x^2 + 13x + 3$ $\begin{array}{c} 12 \cdot 1 \\ \cdot 13 \end{array}$ $\frac{12}{4}$ $\frac{1}{4}$ $(x+3)(x+\frac{1}{4})$ $(x+3)(4x+1)$	$30x^2 + 11x + 1$ $\begin{array}{c} 5 \cdot 6 \\ \cdot 11 \end{array}$ $\frac{6}{30}$ $\frac{1}{30}$ $(x+\frac{1}{6})(x+\frac{1}{5})$ $(6x+1)(5x+1)$	$x^2 - 4x - 12$ $\begin{array}{c} -6 \cdot -2 \\ \cdot -4 \end{array}$ $-6$ $-2$ $(x-6)(x+2)$	$7x^2 - 27x - 4$ $\begin{array}{c} 28 \cdot -1 \\ \cdot -27 \end{array}$ $\frac{-28}{7}$ $\frac{-1}{7}$ $(x-4)(x+\frac{1}{7})$ $(x-4)(7x+1)$
$9x^2 + 12x + 4$ $\begin{array}{c} 6 \cdot 6 \\ \cdot 12 \end{array}$ $\frac{6}{9}$ $\frac{6}{9}$ $(x+\frac{2}{3})(x+\frac{2}{3})$ $(3x+2)(3x+2) = (3x+2)^2$	$40x^2 + 3x - 1$ $\begin{array}{c} -5 \cdot 8 \\ \cdot 3 \end{array}$ $\frac{-8}{40}$ $\frac{8}{40}$ $(x-\frac{1}{8})(x+\frac{1}{5})$ $(8x-1)(5x+1)$	$x^2 + 14x + 40$ $\begin{array}{c} 10 \cdot 4 \\ \cdot 40 \end{array}$ $10$ $4$ $(x+10)(x+4)$	$3x^2 + 13x - 10$ $\begin{array}{c} -30 \cdot 15 \\ \cdot 13 \end{array}$ $\frac{15}{3}$ $\frac{-2}{3}$ $(x+5)(x-\frac{2}{3})$ $(x+5)(3x-2)$
$6x^2 - 11x - 10$ $\begin{array}{c} -6 \cdot -10 \\ \cdot -11 \end{array}$ $\frac{-6}{6}$ $\frac{-10}{6}$ $(x+\frac{2}{3})(x-\frac{5}{2})$ $(3x+2)(2x-5)$	$9x^2 + 30x + 25$ $\begin{array}{c} 15 \cdot 15 \\ \cdot 30 \end{array}$ $\frac{15}{9}$ $\frac{15}{9}$ $(3x+5)(3x+5)$ $(3x+5)^2$	$6x^2 - 19x + 15$ $\begin{array}{c} -9 \cdot -10 \\ \cdot -19 \end{array}$ $\frac{-9}{6}$ $\frac{-10}{6}$ $(2x-3)(3x-5)$	$5x^2 + 14x + 8$ $\begin{array}{c} 40 \cdot 10 \\ \cdot 14 \end{array}$ $\frac{4}{5}$ $\frac{10}{5}$ $(x+\frac{4}{5})(x+2)$ $(5x+4)(x+2)$
$9x^2 - 12x + 4$ $\begin{array}{c} -6 \cdot -6 \\ \cdot -12 \end{array}$ $\frac{-6}{9}$ $\frac{-6}{9}$ $(3x-2)(3x-2)$	$x^2 - 4x - 21$ $\begin{array}{c} -7 \cdot 3 \\ \cdot -4 \end{array}$ $-7$ $3$ $(x-7)(x+3)$	$x^2 - 7x + 12$ $\begin{array}{c} -4 \cdot -3 \\ \cdot -7 \end{array}$ $-4$ $-3$ $(x-4)(x-3)$	$12x^2 + x - 1$ $\begin{array}{c} +4 \cdot -3 \\ \cdot 1 \end{array}$ $\frac{4}{12}$ $\frac{-3}{12}$ $(3x+1)(4x-1)$

$y = \frac{ac}{x}$



on calculator  
2nd table

Find Factors that add up to b

## Perfect Square Trinomials Practice

Cut out four of the problems below to factor. Once factored, glue them into your notebook under the heading "Perfect Square Trinomials."

$x^2 + 10x + 25$ $(x)^2 \quad \checkmark \quad (5)^2$ $2 \cdot x \cdot 5 = 10x$ $(x+5)^2$	$4x^2 + 12x + 9$ $(2x)^2 \quad \checkmark \quad (3)^2$ $2 \cdot 2x \cdot 3 = 12x$ $(2x+3)^2$	$x^2 + 12x + 36$ $x^2 \quad \checkmark \quad (6)^2$ $2 \cdot x \cdot 6 = 12x$ $(x+6)^2$	$36x^2 + 48x + 16$ $(6x)^2 \quad \checkmark \quad (4)^2$ $6x \cdot 4 \cdot 2 = 48x$ $(6x+4)^2$
$9a^2 + 30a + 25$ $(3a)^2 \quad \checkmark \quad (5)^2$ $2 \cdot 3a \cdot 5 = 30a$ $(3a+5)^2$	$16a^2 + 56a + 49$ $(4a)^2 \quad \checkmark \quad (7)^2$ $2 \cdot 4a \cdot 7 = 56a$ $(4a+7)^2$	$121p^2 + 44p + 4$ $(11p)^2 \quad \checkmark \quad (2)^2$ $2 \cdot 11p \cdot 2 = 44p$ $(11p+2)^2$	$81y^2 + 18y + 1$ $(9y)^2 \quad \checkmark \quad (1)^2$ $9y \cdot 2 = 18y$ $(9y+1)^2$
$x^2 - 10x + 25$ $(x)^2 \quad \ominus \quad (5)^2$ $2 \cdot x \cdot 5 = 10x$ $(x-5)^2$	$4x^2 - 12x + 9$ $(2x)^2 \quad \ominus \quad (3)^2$ $2 \cdot 2x \cdot 3 = 12x$ $(2x-3)^2$	$x^2 - 12x + 36$ $x^2 \quad \ominus \quad (6)^2$ $2 \cdot x \cdot 6 = 12x$ $(x-6)^2$	$36x^2 - 48x + 16$ $(6x)^2 \quad \ominus \quad (4)^2$ $(6x-4)^2$
$9a^2 - 30a + 25$ $(3a-5)^2$	$16a^2 - 56a + 49$ $(4a-7)^2$	$121p^2 - 44p + 4$ $(11p-2)^2$	$81y^2 - 18y + 1$ $(9y-1)^2$

## Factoring by grouping (4 or more)

Cut out four of the problems below to factor. Once factored, glue them into your notebook under the heading "Factoring by grouping."

$(8x^3 - 64x^2) + (x - 8)$ $8x^2(x - 8) + (x - 8)$ $(x - 8)(8x^2 + 1)$	$(12x^3 - 21x^2) + (28x - 49)$ $3x^2(4x - 7) + 7(4x - 7)$ $(4x - 7)(3x^2 + 7)$	$(12x^3 + 2x^2) - (30x - 5)$ $2x^2(6x + 1) - 5(6x + 1)$ $2x^2(6x + 1) + 5(6x + 1)$ $(6x + 1)(2x^2 + 5)$	$(6x^3 - 16x^2) + (21x - 56)$ $2x^2(3x - 8) + 7(3x - 8)$ $(3x - 8)(2x^2 + 7)$
$(25x^3 + 5x^2) + (30x + 6)$ $5x^2(5x + 1) + 6(5x + 1)$ $(5x + 1)(5x^2 + 6)$	$(28x^3 + 16x^2) - (21x - 12)$ $4x^2(7x + 4) - (-3)(7x + 4)$ $4x^2(7x + 4) + 3(7x + 4)$ $(7x + 4)(4x^2 + 3)$	$(4x^3 - 12x^2) - (6x + 15)$ $4x^2(x - 3) - 5(x - 3)$ $4x^2(x - 3) + 5(x - 3)$ $(x - 3)(4x^2 + 5)$	$(49x^3 - 35x^2) + (56x - 40)$ $7x^2(7x - 5) + 8(7x - 5)$ $(7x - 5)(7x^2 + 8)$
$(24x^3 + 15x^2) - (56x - 35)$ $3x^2(8x + 5) - (-7)(8x + 5)$ $3x^2(8x + 5) + 7(8x + 5)$ $(8x + 5)(3x^2 + 7)$	$(24x^3 - 64x^2) - (21x + 56)$ $8x^2(3x - 8) - (-7)(3x - 8)$ $8x^2(3x - 8) + 7(3x - 8)$ $(3x - 8)(8x^2 + 7)$	$(30xy + 36x^2) + (5y + 30x)$ $6x(5y + 6x) + 5(5y + 6x)$ $(5y + 6x)(6x + 5)$	$28xy + 35x + 20y + 25$ $7x(4y + 5) + 5(4y + 5)$ $(4y + 5)(7x + 5)$
$-24y + 4xy + 6 - x$ $-4y(6 - x) + (6 - x)$ $(6 - x)(-4y + 1)$	$16xy - 4x^2 + 28y - 7x$ $4x(4y - x) + 7(4y - x)$ $(4y - x)(4x + 7)$	$(21x^3 - 35x^2) - (15x - 25)$ $7x^2(3x - 5) - 5(3x - 5)$ $7x^2(3x - 5) + 5(3x - 5)$ $(3x - 5)(7x^2 + 5)$	$(7x^3 - 28x^2) + (5x - 20)$ $7x^2(x - 4) + 5(x - 4)$ $(x - 4)(7x^2 + 5)$