

NOTES: Factoring Review

- Goals: #1 - I can factor monomial expressions.
 #2 - I can factor binomial expressions.
 #3 - I can factor trinomial expressions.

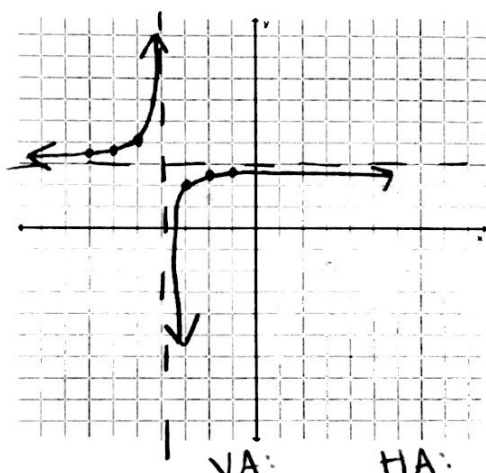


Homework: Factoring Review Worksheet

Warm Up:

1. Graph the function. Identify the graph's asymptotes and the function's domain and range.

a. $y = \frac{-1}{x+4} + 3$



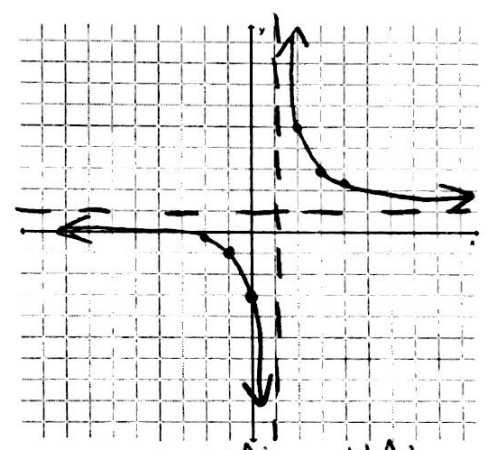
X	Y
-7	3.3
-6	3.5
-5	4
-4	-
-3	2
-2	2.5
-1	2.7

asymptotes: VA: $x = -4$ HA: $y = 3$

domain: $\mathbb{R}, x \neq -4$

range: $\mathbb{R}, y \neq 3$

b. $f(x) = \frac{x+3}{x-1}$



X	Y
-2	-0.3
-1	-1
0	-3
1	-
2	5
3	3
4	2.3

asymptotes: VA: $x = 1$ HA: $y = 1$

domain: $\mathbb{R}, x \neq 1$

range: $\mathbb{R}, y \neq 1$

Exploration #1: Work with a partner and factor the following expressions.

1. $x^2 - 12x + 20$

$(x-10)(x-2)$

2. $5x^2 - 8x - 4$

$5x^2 - 10x + 2x - 4$
 $5x(x-2) + 2(x-2)$
 $(5x+2)(x-2)$

3. $x^2 - 16$

$(x+4)(x-4)$

Name: _____ Hour: _____ Date: _____

Notes:

A monomial expression is a single term: $5, 15x^2, 9x^7$

To factor monomials, we write them as factor strings.

Example: $45x^3$
 $\begin{array}{c} 9 \quad 5 \\ \wedge \quad / \\ 3 \quad 3 \end{array}$

$$5 \cdot 3 \cdot 3 \cdot x \cdot x \cdot x$$

Practice: Factor the monomial expressions.

1. $18x^2$
 $\begin{array}{c} 9 \quad 2 \\ \wedge \quad / \\ 3 \quad 3 \end{array}$

$$3 \cdot 3 \cdot 2 \cdot x \cdot x$$

2. $50x^7$
 $\begin{array}{c} 5 \quad 10 \\ \wedge \quad / \\ 5 \quad 2 \end{array}$

$$5 \cdot 5 \cdot 2 \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x$$

3. $4x$
 $\begin{array}{c} 2 \quad 2 \\ \wedge \quad / \end{array}$

$$2 \cdot 2 \cdot x$$

Notes:

A binomial expression has exactly two terms: $x+2, 14x-7$

To factor binomials, we first check if we can factor out a GCF.

greatest common factor

Example: $8x^2 - 2x$

$$2x(4x-1)$$

Some binomials have special factoring patterns we need to look for!

- Difference of Two Squares $a^2 - b^2 \rightarrow (a+b)(a-b)$

Example: $x^2 - 16$

$$(x+4)(x-4)$$

- Sum/Difference of Two Cubes: $a^3 - b^3 \rightarrow (a-b)(a^2 + ab + b^2)$
 $a^3 + b^3 \rightarrow (a+b)(a^2 - ab + b^2)$

Example: $x^3 - 64$

$$(x-4)(x^2 + 4x + 16)$$

Name: _____ Hour: _____ Date: _____

Practice: Factor the binomial expressions.

1. $14x^3 - 21x^2$
 $7x^2(2x - 3)$

2. $p^4 - 4p^2$
 $p^2(p^2 - 4)$
 $p^2(p + 2)(p - 2)$

3. $2x^5 + 54x^2$
 $2x^2(x^3 + 27)$
 $(x)^3 \quad (3)^3$
 $2x^2(x + 3)(x^2 - 3x + 9)$

Notes:

A trinomial expression has exactly three terms: $3x^2 - 2x + 1$
 $5x^7 + 4x^3 - x$

To factor trinomials, we first check if we can factor out a GCF.

Then, we use the AC method to factor.

Example: $2x^2 + 5x + 2$ $2 \cdot 2 = 4$
 $4 \wedge$
 $4 + 1 = 5$
 $2x^2 + 4x + 1x + 2$
 $2x(x + 2) + 1(x + 2)$
 $(x + 2)(2x + 1)$

Practice: Factor the trinomial expressions.

1. $x^2 - 9x + 20$
 $(x - 5)(x - 4)$

2. $12x^2 - 28x - 24$
 $4(3x^2 - 7x - 6)$ $3 \cdot -6 = -18$
 $4(3x^2 - 9x + 2x - 6)$ $-7 = -9 + 2$
 $4(3x(x - 3) + 2(x - 3))$
 $4(x - 3)(3x + 2)$

3. $3x^2 + 10x - 8$ $3 \cdot -8 = -24$
 $10 = 12 + -2$
 $3x^2 + 12x - 2x - 8$
 $3x(x + 4) - 2(x + 4)$
 $(x + 4)(3x - 2)$