Algebra 1 – Unit 10 Guide

Factoring Polynomials

Look for a GCF

Examples

Examples

Example

Example
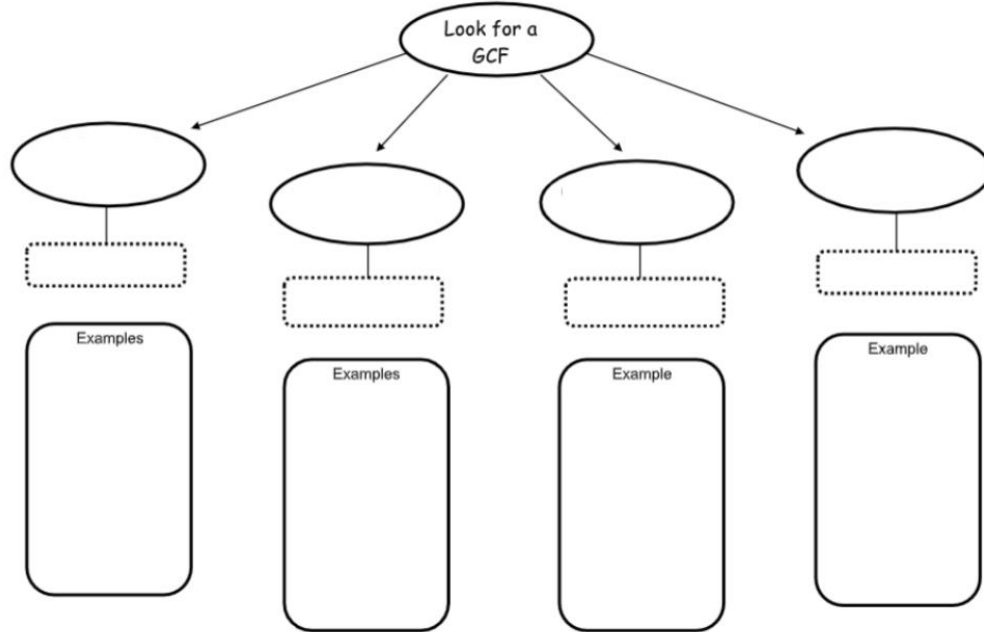
Skill #1 – Factoring out a Greatest Common Factor

Factor the GCF out of an Expression

$4x+8 \rightarrow GCF(\_ + \_) \rightarrow 4(x+2)$

$$\begin{array}{c|c} 4x & 8 \\ \div 4 & \div 4 \\ \hline x & 2 \end{array}$$

4

Check It
$4(x+2)$
$=4x+8$

Skill #1 – Factoring with a Coefficient of 1	Skill #2 – Factoring with a Coefficient of a

Skill #1 – Factoring with a Coefficient of 1

$$\overset{A}{} \quad \overset{M}{}$$
$x^2 - 7x + 10$

$(x - 2)(x - 5)$

Multiply: 10
Add: -7

$1 \cdot 10$

$2 \cdot 5$

$-1 \cdot -10$

$\boxed{-2 \cdot -5}$

Check:
$x^2 - 5x - 2x + 10$
$x^2 - 7x + 10$

Skill #2 – Factoring with a Coefficient of a

$2x^2 + x - 6$

Find factors of -12 that add up to 1

$-3 \times 4 = -12$
$-3 + 4 = 1$

1. Take the two numbers -3 and 4, and put them, **complete with signs and variables,** in the diagonal corners, like this:

$2x^2$	$-3x$
$4x$	-6

It does not matter which way you do the diagonal entries!

Skill #3 – Factoring by Grouping	Skill #2 – Factoring Difference of Squares

Skill #3 – Factoring by Grouping

$3x^2 + 6x + 4x + 8$

$= (3x^2 + 6x) + (4x + 8)$

$= 3x(x + 2) + 4(x + 2)$

$= (x + 2)(3x + 4)$

Skill #2 – Factoring Difference of Squares

FACTOR: $4x^2 - 9$

coefficient: 4   9
variable: x   none

$\sqrt{4} = 2$ $\sqrt{9} = 3$

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

Check: $4x^2 - 6x + 6x - 9 = 4x^2 - 9$

Algebra 1 – Unit 10 Study Packet

Factoring Polynomials

Skill #1 – Factoring out a Greatest Common Factor

1. What is the greatest common monomial factor of $$18k^4 + 12k^3 - 9k^2$$ A 3 B $3k^2$ C k D $3k$	2. What is the greatest common monomial factor of $$16x - 4x^2$$ A 4 B $4x^2$ C x D $4x$
3. What is the completely factored form of the following expression? $$5x + 40$$ A $5(x - 8)$ B $5(x + 40)$ C $-5(x - 8)$ D $5(x + 8)$	4. When completely factored, write an expression that is equivalent to $$3x^2y^4 + 6xy^5$$

Skill #1   □ Factor out the greatest common factor of a polynomial.
                   □ Need more practice (IXL – AA.1 and AA.2)

Skill #2 – Factoring with a Coefficient of 1

5. What are the factors of $$x^2 + 5x - 24$$	6. What are the factors of $$x^2 + 12x + 35$$
7. What is the completely factored form of the following expression? $$x^2 - 3x - 40$$ A $(x + 5)(x + 8)$ B $(x - 5)(x - 8)$ C $(x + 5)(x - 8)$ D $(x - 5)(x + 8)$	8. Which of the following is a factor of $$x^2 - 14x + 45$$ A $(x + 5)$ B $(x - 5)$ C $(x + 9)$ D $(9x - 5)$

9. Select all of the following that are factors of the given polynomial

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

$(x + 6)$	$(x + 5)$	$(x + 1)$	$(x + 3)$
$(x - 5)$	$(x + 4)$	$(x - 1)$	$(x + 2)$

Skill #2   □ Factor a trinomial with a coefficient of 1
                   □ Need more practice (IXL – AA.4)

10. What are the factors of	11. What are the factors of
$$3y^2 - 8y + 5$$	$$4x^2 + 8x + 3$$

12. What is the completely factored form of the following expression?	13. Which of the following is a factor of
$$3h^2 - 7h - 6$$	$$2k^2 + 5k - 3$$
A $(3h + 2)(h + 3)$ B $(h + 2)(3h - 3)$ C $(3h + 2)(h - 3)$ D $(h - 2)(3h + 3)$	A $(2k - 1)$ B $(k + 1)$ C $(k - 3)$ D $(2k - 3)$

14. Select all of the following that are factors of the given polynomial

$$6x^2 + 4x - 2$$

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

Skill #3   □ Factor a trinomial with a coefficient of a
           □ Need more practice (IXL – AA.5)

13. What is the completely factored form of the following expression?	14. Which of the following is a factor of
$$15g^3 + 5g^2 + 3g + 1$$	$$2x^3 - x^2 + 4x - 2$$
	A $(4x - 2)$ B $(x - 1)$ C 2 D $(2x - 1)$

15. When factored completely, the following equals $$b(b + 3) - 4(b + 3)$$	16. When factored completely, the following equals $$2x(x - 2) + 9(x - 2)$$
A $b(b + 3)$ B $(b - 4)(b + 3)$ C $(b + 4)(b - 3)$ D $-4(b + 3)$	A $(2x + 9)(x + 2)$ B $(9x + 9)(x - 2)$ C $(2x + 9)(x - 2)$ D $2x(x - 2)$

Skill #4	□ Factor a four term polynomial with grouping method □ Need more practice (IXL – AA.7)

17. When factored completely, the following is equal to: $$x^2 - 49$$	18. When factored completely, the following is equal to: $$4x^2 - 81$$
19. When factored completely, the following is equal to: $$18x^2 - 200$$	20. When factored completely, the following is equal to: $$5x^2 - 180$$

Skill #5	□ Factor two term polynomials using the difference of squares method □ Need more practice (IXL – AA.6)

Skill #6 – Factoring Mixed Review

21. What are the factors of $$x^2 - 8x + 16$$	22. What are the factors of $$9x^2 - 4$$

23. What are the factors of $$7x^3 + 14x + 7x$$	24. What are the factors of $$2x^3 - 4x^2 - 3x - 6$$
25. What are the factors of $$3x^2 - 11x - 20$$	26. What are the factors of $$4x^2 + 12x - 40$$
27. What are the factors of $$x^2 + 15x + 56$$	28. What are the factors of $$18x^3 + 30x^2 + 3x + 5$$
29. What are the factors of $$x^2 - 16x + 64$$	30. What are the factors of $$169x^2 - 196$$

Skill #5   □ Factor completely first- and second-degree polynomials in one variable with integral
          coefficients.
          □ Need more practice (IXL – AA.8)