Advanced Algebra Worksheet: Factoring Polynomials (Mixed Methods) Smartee Bee \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

BEE SMART! Use this decision making process when factoring polynomials.

1. Is there a GCF? If “yes”, then factor it out!
2. Count the number of terms. The number of terms will tell you which patterns to consider.
* If your polynomial is a binomial, look for the *difference of squares*, the *sum of cubes*, or the *difference of cubes*. Remember that perfect squared exponents are even and cubed exponents are multiples of three.
* If your polynomial is a trinomial, try the “BIG X” (*product/sum*) method.
* If your polynomial has four terms, factor by *grouping*.
1. Factor the polynomial completely (use separate paper, if necessary). If the polynomial does not factor, write “Prime”.

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| polynomial | # of terms | Is there a GCF? | Rewrite polynomial with GCF factored out | Which pattern should I use? | Fully factored form of polynomial |
| 1. 2x2 – x – 15 |  |  |  |  |  |
| 2. 5x2 - 20 |  |  |  |  |  |
| 3. 4x3- 32 |  |  |  |  |  |
| 4. 3x2 – 33x + 84 |  |  |  |  |  |
| 5. 2x3 + 8x2 – 18x – 72 |  |  |  |  |  |
| 6. 16x3 + 250 |  |  |  |  |  |
| 7. 3x2 + 12x – 36 |  |  |  |  |  |
| 8. 3x4 - 10x3 – 48x2 + 160x |  |  |  |  |  |
| 9. 10x3 – 12x2 + 2x |  |  |  |  |  |
| 10. 1000x3 + 8 |  |  |  |  |  |
| 11. 8x5y – 2xy |  |  |  |  |  |
| 12. 3x + 7x2 |  |  |  |  |  |
| 13. 5x2 + 5x + 100 |  |  |  |  |  |



Apply:

1. Write an expression in factored form to represent the shaded area in the middle.
2. Write an expression in factored form to represent the entire area. Distribute the factors and change

 to standard form.

1. Write an expression in factored form to represent the unshaded area alone.