EMA
GCF and Factoring by Grouping

Name key
Date_____ **Period**_____

GREATEST is biggest or largest.

COMMON is something shared or in common.

FACTORS are the parts of multiplication facts.

$9x^2 - 3x$

GCF = $3x$ — **Find the GCF.**

$\frac{9x^2}{3x} - \frac{3x}{3x}$ — **Divide by GCF.**

$\boxed{3x(3x - 1)}$

Prime Numbers: Numbers that can only be divided by 1.

Factor each polynomial.

1. $3x+8$

PRIME

2. $6x-4$

$2(3x-2)$

3. v^4-4v^3

$v^3(v-4)$

4. $12x^3-18x$

$6x(2x-3)$

5. x^3y^2+x

$x(x^2y^2+1)$

6. $2x^2-10x^4$

$2x^2(1-5x^2)$

7. $18a^2bc^2+48abc^3$

$6abc^2(3a+8c)$

8. $12x^2y^2z-40xy^3z^2$

$4xy^2z(3x-10yz)$

9. $4x^3-32xy$

$4x(x^2-8y)$

10. $48x+24x^4-30x^2$

$6x(8+4x^3-5x)$

11. $12x+5y-15z^2$

PRIME

12. $14gh-18h$

$2h(7g-9)$

Factor each polynomial by grouping.

13. $2x(x-y)+y(x-y)$

$(2x+y)(x-y)$

14. $w(2x+3y)-8(2x+3y)$

$(w-8)(2x+3y)$

15. $3p(2q-p)-2q(2q-p)$

$(3p-2q)(2q-p)$

16. $2a(a+3)-(a+3)$

$(2a-1)(a+3)$

17. $(x^3+10x^2)+(5x+50)$

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

$\boxed{(x^2+5)(x+10)}$

18. $(15x^3+5x^2)+(3x+1)$

$5x^2(3x+1)+1(3x+1)$

$\boxed{(5x^2+1)(3x+1)}$

19. $(6x^3+10x^2)+(3x+5)$

$2x^2(3x+5)+1(3x+5)$

$\boxed{(2x^2+1)(3x+5)}$

20. $(20xy+12x)+(15y+9)$

$4x(5y+3)+3(5y+3)$

$\boxed{(4x+3)(5y+3)}$

21. $(20r^3-4r^2)+(15r-3)$

$4r^2(5r-1)+3(5r-1)$

$\boxed{(4r^2+3)(5r-1)}$

22. $(24xy+64x^2)+(42y+112x)$

$8x(3y+8x)+14(3y+8x)$

$\boxed{(8x+14)(3y+8x)}$