

Name \_\_\_\_\_

Module 14 Review

1. Factor out the Common Monomial

A)  $6x^3y^2 + 18x^2y^3 - 24x^7$   
 $6x^2(xy^2 + 3y^3 - 4x^5)$

B)  $-8x^7yz + 12x^4y^3z - 12x^3$   
 $-4x^3(2x^4yz - 3xy^3z + 3)$

C)  $-20y^2z^6x^3 - 40y^4z^6x - 36y^2z^6$   
 $-4y^2z^6(5x^3 + 10y^2x + 9)$

D. What do we say if an expression cannot be factored?

Prime

E. What is the 1<sup>st</sup> step we do EVERY SINGLE TIME WE FACTOR?!?!?

take out the greatest common factor

Factor completely

1.  $36x^8 - y^2z^{10}$

$$(6x^4 + yz^5)(6x^4 - yz^5)$$

3.  $x - 9x^3$

$$x(1 - 9x^2)$$

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

4.  $16v^2 + 8v + 1$

$$\begin{array}{r} 4 \quad 16 \quad 4 \\ \quad \times \\ 8 \end{array}$$

$$(16v^2 + 4v)(4v + 1)$$

$$4v(4v + 1)(4v + 1)$$

$$(4v + 1)(4v + 1)$$

5.  $16a^2 - 48a + 36$

$$\begin{array}{r} 36 \\ -6 \quad -6 \\ \quad -12 \end{array}$$

$$4(4a^2 - 12a + 9)$$

$$(4a^2 - 6a - 6a + 9)$$

$$2a(2a - 3) - 3(2a - 3)$$

$$4(2a - 3)(2a - 3)$$

6.  $5x^2 - 9x - 2$

$$\begin{array}{r} -10 \\ -10 \quad -9 \\ \quad -1 \end{array}$$

$$(5x^2 - 10x) + (1x - 2)$$

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

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

7.  $x^6 - x^3 - 20$

$$\begin{array}{r} -20 \\ -5 \quad 4 \\ \quad -1 \end{array}$$

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

8.  $3m^2 - m - 30$   $\begin{array}{r} -90 \\ -10 \quad 9 \\ \hline -1 \end{array}$

$(3m^2 - 10m) + (9m - 30)$

$\Rightarrow m(3m - 10) + 3(3m - 10)$

$(m + 3)(3m - 10)$

9.  $5x^3 - 40x^2 + 60x$

$5x(x^2 - 8x + 12)$   $\begin{array}{r} 12 \\ -2 \quad -6 \\ \hline -8 \end{array}$

$5x(x - 2)(x - 6)$

10.  $8a^2 - 4a$

$4a(2a - 1)$

11.  $x^{12} + 2x^6 - 48$   $\begin{array}{r} -48 \\ 8 \quad -6 \\ \hline 2 \end{array}$

$(x^6 + 8)(x^6 - 6)$

12.  $12x^4 - 19x^2 - 18$   $\begin{array}{r} -216 \\ 8 \quad -27 \\ \hline -19 \end{array}$

$(12x^4 + 8x^2 - 27x^2 - 18)$

$4x^2(3x^2 + 2) - 9(3x^2 + 2)$

$(4x^2 - 9)(3x^2 + 2)$

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

13.  $7x^2 + x - 8$   $\begin{array}{r} -56 \\ 8 \quad -7 \\ \hline 1 \end{array}$

$(7x^2 + 8x - 7x - 8)$

$x(7x + 8) - 1(7x + 8)$

$(x - 1)(7x + 8)$

14.  $3x^3 + 18x^2 - 120x$   $\begin{array}{r} -40 \\ 10 \quad -4 \\ \hline 6 \end{array}$

$3x(x^2 + 6x - 40)$

$3x(x + 10)(x - 4)$

15.  $-6x^4 + 5x^3 + 4x^2$   $\begin{array}{r} -24 \\ -8 \quad 3 \\ \hline -5 \end{array}$

$-x^2(6x^2 - 5x - 4)$

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

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

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

$$16. -x^3 - 10x^2 - 16x$$

$$-x(x^2 + 10x + 16)$$

$$\boxed{-x(x+8)(x+2)}$$

$$\begin{array}{r} 16 \\ 8 \times 2 \\ \hline 10 \end{array}$$

$$17. 4x^2 + 10x + 4$$

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

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

$$2x(x+2) + 1(x+2)$$

$$\boxed{2(2x+1)(x+2)}$$

$$\begin{array}{r} 4 \\ 4 \times 1 \\ \hline 5 \end{array}$$

$$18. -x^2 + 7x - 10$$

$$-(x^2 - 7x + 10)$$

$$\boxed{-(x-5)(x-2)}$$

$$\begin{array}{r} 10 \\ -5 \times -2 \\ \hline -7 \end{array}$$

$$19. x^8 - 2x^4 - 63$$

$$(x^4 - 9)(x^4 + 7)$$

$$\boxed{(x^2+3)(x^2-3)(x^4+7)}$$

$$\begin{array}{r} -63 \\ -9 \times 7 \\ \hline -2 \end{array}$$

$$20. b^2 - 3b - 28$$

$$\boxed{(b-7)(b+4)}$$

$$\begin{array}{r} -28 \\ -7 \times 4 \\ \hline -3 \end{array}$$

$$21. 72x^8 - 8$$

$$8(9x^8 - 1)$$

$$\boxed{8(3x^4+1)(3x^4-1)}$$

$$22. (x^5 - 4x^4)(9x + 36)$$

$$x^4(x-4) - 9(x-4)$$

$$(x^4 - 9)(x-4)$$

$$\boxed{(x^2+3)(x^2-3)(x-4)}$$

$$23. p^2 - 4p + 24$$

$\boxed{\text{prime}}$

$$\begin{array}{r} 24 \\ \hline -4 \end{array}$$