

# Remember to ADD extra step and divide Product/sum pair when leading coefficient $\neq 1$

Name \_\_\_\_\_

Date \_\_\_\_\_

Factor each polynomial using a GCF:

1.  $10x + 45$

$5(2x + 9)$

2.  $121k - 33$

$11(11k - 3)$

3.  $4x^3 + 16x^2 - 44$

$4(x^3 + 4x^2 - 11)$

4.  $72a^8 + 33a^5 - 42a^3$

$3a^3(24a^5 + 11a^2 - 14)$

GCF only.

Factor each polynomial:

5.  $x^2 + 24x - 25$

$(x + 25)(x - 1)$

$\begin{array}{r} -25 \\ 25 \times -1 \\ \hline 24 \end{array}$

6.  $x^2 - 7x - 8$

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

$\begin{array}{r} -8 \\ -8 \times +1 \\ \hline -7 \end{array}$

7.  $x^2 - 2x - 24$

$(x - 6)(x + 4)$

$\begin{array}{r} -24 \\ -6 \times +4 \\ \hline -2 \end{array}$

8.  $5x^2 - 14x - 3$

$(x - 3)(5x + 1)$

$\begin{array}{r} -15 \\ -15 \times +1 \\ \hline -14 \\ \downarrow -3 \end{array}$

9.  $2x^2 - 11x - 6$

$(x - 6)(2x + 1)$

$\begin{array}{r} -12 \\ -12 \times +1 \\ \hline -11 \\ \downarrow -6 \end{array}$

10.  $2x^2 + 17x - 9$

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

$\begin{array}{r} -18 \\ 18 \times -1 \\ \hline 17 \\ \downarrow 9 \end{array}$

11.  $3x^2 + 11x - 4$

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

$\begin{array}{r} -12 \\ 12 \times -1 \\ \hline 11 \\ \downarrow 4 \end{array}$

12.  $5x^2 + 9x - 2$

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

$\begin{array}{r} -10 \\ 10 \times -1 \\ \hline 9 \\ \downarrow 2 \end{array}$

13.  $2x^2 + 8x - 42$

$2(x^2 + 4x - 21)$

GCF!

$\begin{array}{r} -21 \\ 7 \times -3 \\ \hline 4 \end{array}$

$2(x + 7)(x - 3)$

BIG X

14.  $3x^2 - 4x - 4$

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

$\begin{array}{r} -12 \\ -6 \times 2 \\ \hline -4 \\ \downarrow -2 \end{array}$

15.  $x^2 + 18x + 81$

$(x+9)(x+9)$

$\begin{array}{r} 81 \\ 9 \times 9 \\ 18 \end{array}$

16.  $4x^2 + 4x + 1$

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

$\begin{array}{r} 4 \\ 2 \times 2 \\ 4 \end{array}$   
 $\begin{array}{r} 4 \\ 2 \times 2 \\ 4 \end{array}$   
 $\frac{1}{2}$   $\frac{1}{2}$

17.  $9x^2 - 6x + 1$

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

$\begin{array}{r} 9 \\ -3 \times -3 \\ 9 \end{array}$   
 $\begin{array}{r} 9 \\ -6 \\ 9 \end{array}$   
 $-\frac{1}{3}$   $-\frac{1}{3}$

18.  $2x^2 + x - 15$

$(x+3)(2x-5)$

$\begin{array}{r} -30 \\ 6 \times -5 \\ 1 \end{array}$   
 $\begin{array}{r} -30 \\ 1 \times -5 \\ 1 \end{array}$   
 $\frac{6}{2}$   $3$

19.  $4x^2 + 12x + 5$

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

$\begin{array}{r} 20 \\ 10 \times 2 \\ 12 \end{array}$   
 $\begin{array}{r} 20 \\ 12 \times 2 \\ 12 \end{array}$   
 $\frac{5}{2}$   $\frac{1}{2}$

20.  $3x^3 - 24x^2 + 48x$  **GCF!**

$3x(x^2 - 8x + 16)$   
 BIG X

$3x(x-4)(x-4)$

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

21.  $x^2 + x - 20$

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

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

22.  $3x^2 + 2x - 21$

$(x+3)(3x-7)$

$\begin{array}{r} -63 \\ 9 \times -7 \\ 2 \end{array}$   
 $\begin{array}{r} -63 \\ 2 \times -7 \\ 2 \end{array}$   
 $\frac{9}{3}$   $3$

23.  $2x^2 + 5x - 3$

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

$\begin{array}{r} -6 \\ 6 \times -1 \\ 5 \end{array}$   
 $\begin{array}{r} -6 \\ 5 \times -1 \\ 5 \end{array}$   
 $3$

24.  $6x^2 + 28x + 30$  **GCF!**

$2(3x^2 + 14x + 15)$

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

$\begin{array}{r} 45 \\ 9 \times 5 \\ 14 \end{array}$   
 $\begin{array}{r} 45 \\ 14 \times 5 \\ 14 \end{array}$   
 $\frac{9}{3}$   $3$

25.  $3x^2 - 28x + 9$

$(x-9)(3x-1)$

$\begin{array}{r} 27 \\ -27 \times -1 \\ -28 \end{array}$   
 $\begin{array}{r} 27 \\ -28 \times -1 \\ -28 \end{array}$   
 $-9$

26.  $6x^2 + 5x - 4$

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

$\begin{array}{r} -24 \\ 8 \times -3 \\ 5 \end{array}$   
 $\begin{array}{r} -24 \\ 5 \times -3 \\ 5 \end{array}$   
 $\frac{8}{6}$   $\frac{4}{3}$   $-\frac{1}{2}$