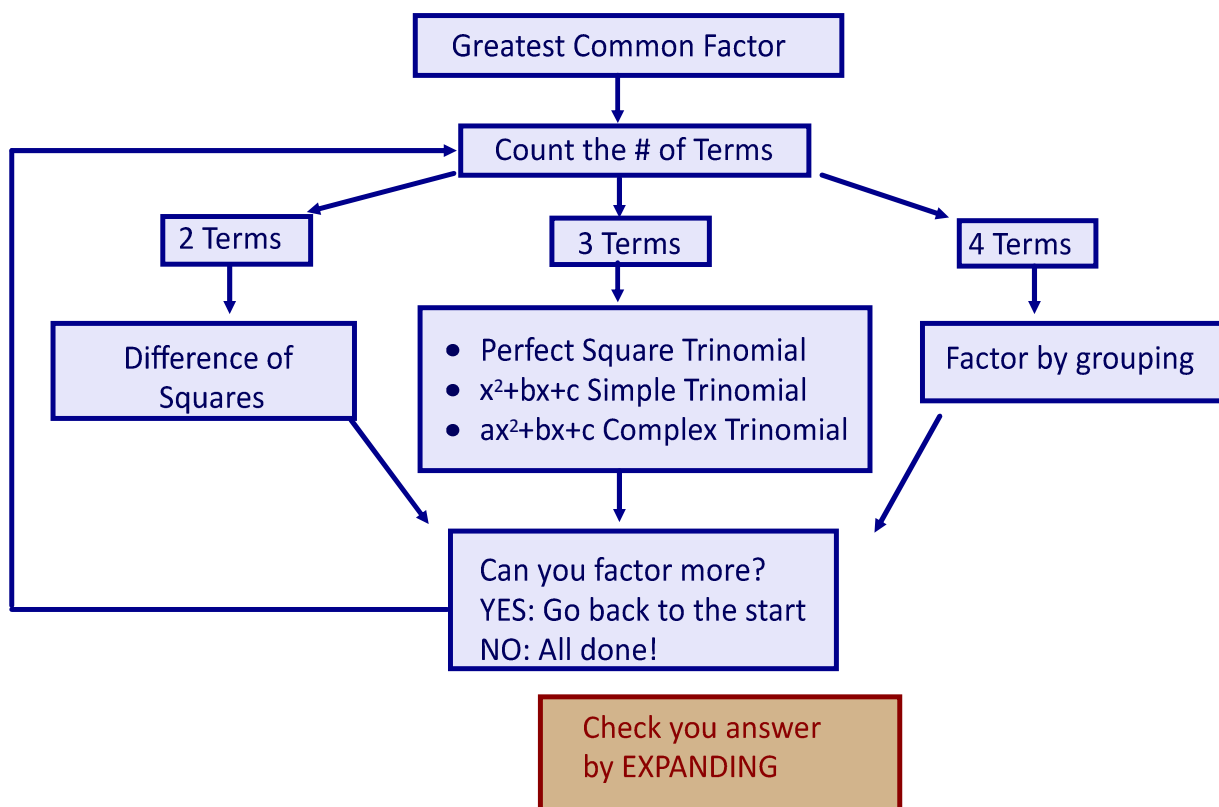


## 4.8 Factoring Practice

### Factoring Decision Tree



Ex. 1 Factor, if possible.

a)  $x^2 - 2x - 15$

M -15 =  $(x-5)(x+3)$   
 A -2  
 N -5, 3

b)  $16x^2 - 49y^2z^4$

=  $(4x + 7yz^2)(4x - 7yz^2)$

c)  $15x^2 + 27x - 6$

=  $3(5x^2 + 9x - 2)$

M -10 =  $3(x+2)(5x-1)$   
 A 9  
 N  $\frac{5x}{10}, \frac{5x}{-1}$   
 $\frac{x}{2}$

d)  $9x^2 - 42xy + 49y^2$

=  $(3x - 7y)^2$

e)  $3x^2 + 7x - 12$

M -36  
 A 7  
 N

Prime!  
 Cannot factor!  
 NOT factorable!

36  
 1, 36  
 2, 18  
 3, 12  
 4, 9  
 6, 6

f)  $3x^2 - 18x + 24$

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

M 8  
 A -6  
 N -4, -2

$$\begin{aligned}
 \text{g) } & (x+4)^2 - (5x-2y)^2 \\
 & = ((x+4) - (5x-2y))((x+4) + (5x-2y)) \\
 & = (x+4-5x+2y)(x+4+5x-2y) \\
 & = (-4x+2y+4)(6x-2y+4) \\
 & = (2)(-2x+y+2)(2)(3x-y+2) \\
 & = 4(-2x+y+2)(3x-y+2)
 \end{aligned}$$

$$\begin{aligned}
 \text{h) } & 8x^2 + 10xy - 3y^2 \\
 & = (4x-y)(2x+3y) \quad \begin{array}{l} M \quad -24 \\ A \quad 10 \\ N \end{array} \\
 & \quad \quad \quad \begin{array}{l} \frac{8x}{-2}, \frac{8x}{12} \\ \frac{4x}{-1}, \frac{2x}{3} \end{array}
 \end{aligned}$$

$$\begin{aligned}
 \text{i) } & 20x^2 + 100xy + 125y^2 \\
 & = 5(4x^2 + 20xy + 25y^2) \\
 & = 5(2x + 5y)^2
 \end{aligned}$$

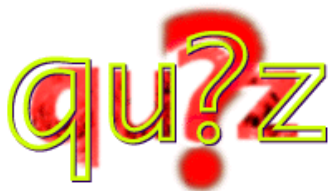
$$\begin{aligned}
 \text{j) } & 6x^3 + 6x^2 - 8x - 8 \\
 & = 2(3x^3 + 3x^2 - 4x - 4) \\
 & = 2[3x^2(x+1) - 4(x+1)] \\
 & = 2[(x+1)(3x^2 - 4)] \\
 & = 2(x+1)(3x^2 - 4)
 \end{aligned}$$

$$\begin{aligned}
 \text{k) } & 4(z^3 - 5) - 2x(5 - z^3) \\
 & = 4(z^3 - 5) + 2x(z^3 - 5) \\
 & = (z^3 - 5)(4 + 2x) \\
 & = (z^3 - 5)(2)(2 + x) \\
 & = 2(z^3 - 5)(2 + x)
 \end{aligned}$$

$$\begin{aligned}
 \text{l) } & (x+2)^2 - 9 \\
 & = [x+2 + 3][x+2 - 3] \\
 & = (x+5)(x-1)
 \end{aligned}$$

$$\begin{aligned}
 \text{m) } & 36 - (3x-4)^2 \\
 & = [6 + (3x-4)][6 - (3x-4)] \\
 & = (6+3x-4)(6-3x+4) \\
 & = (3x+2)(-3x+10)
 \end{aligned}$$

$$\begin{aligned}
 \text{n) } & 4 - (x^2 + 6xy - 9y^2) \\
 & = 4 - (x^2 - 6xy + 9y^2) \\
 & = 4 - (x-3y)^2 \\
 & = (2 - (x-3y))(2 + (x-3y)) \\
 & = (2-x+3y)(2+x-3y)
 \end{aligned}$$



Factor, if possible.

a)  $x^2 + 14x + 45$

b)  $121w^2 - 144$

c)  $3k^2 + 12k - 36$

d)  $4m^2 + 12m + 3m + 9$

e)  $8h^2 - 16h + 4$

f)  $125 - (y - 5)^2$

g)  $w^4 - 16$

h)  $12b^2 - 15b + 3$

Answers

a)  $(x+9)(x+5)$

b)  $(11w-12)(11w+12)$

c)  $3(k+6)(k-2)$

d)  $(m+3)(4m+3)$

e)  $4(2h^2 - 4h + 1)$

f) Prime

g)  $(w^2+4)(w-2)(w+2)$

h)  $3(b-1)(4b-1)$

**FBUHL: Handout**