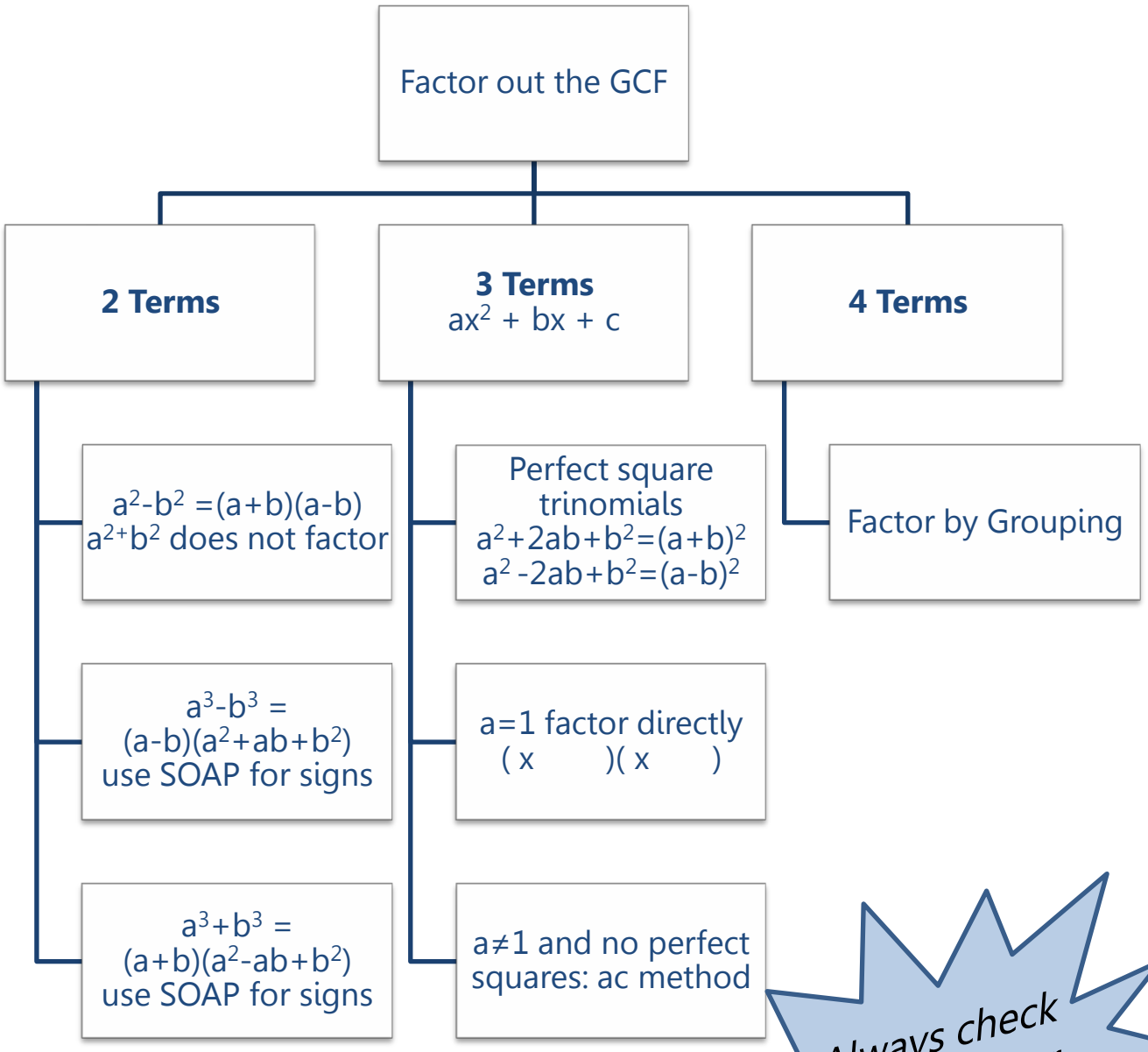
Factoring Strategy



SOAP : **S**ame, **O**pposite, **A**lways **P**ositive

Always check your answer by multiplying it out!

Cara Lee

Section 7.5 – A general factoring strategy

Put all of the types of factoring together

Look at the factoring chart

Keep breaking factors down until each one is prime

2. $4x^3 - 100x$ Look for GCF: $4x$

$= 4x(x^2 - 25)$ Difference of squares

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

10. $x^3 + 3x^2 - 25x - 75$ No GCF, 4 terms use grouping

$= x^2(x+3) - 25(x+3)$

$= (x+3)(x^2 - 25)$ x^2 keep going

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

12. $5x^3 - 20x^2 + 20x$ GCF $= 5x$

$= 5x(x^2 - 4x + 4)$ perfect squares

$= 5x(x-2)(x-2)$

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

14. $2x^5 + 128x^2$

$= 2x^2(x^3 + 64)$ perfect cubes (x^3, 4^3)

$= 2x^2(x+4)(x^2 - 4x + 16)$

26. $3r^2 - 27r$ GCF = $3r$

$3r(r-9)$ no more squares

28. $35w^2 - 2w - 1$ NO GCF, AC method

$35 \cdot -1 = -35$

$1 \cdot 35$

$5 \cdot -7$

$= 35w^2 - 7w + 5w - 1$

$= 7w(5w-1) + 1(5w-1)$

$= (5w-1)(7w+1)$

48. $21x^2 - 25x - 4$ NO GCF, Ac method

$21(-4) = -84$

$1 \cdot 84$

$2 \cdot 42$

$3 \cdot 28$

$= 21x^2 + 3x - 28x - 4$

$= 3x(7x+1) - 4(7x+1)$

$= (7x+1)(3x-4)$

$3\overline{)84}$ 28, 6, 24

50. $100y^2 - 49$ perfect squares with a —

$= (10y+7)(10y-7)$

54. $12y^3+16y^2-3y-4$ No gcf; 4 terms – use grouping

$= 4y^2(3y+4) - 1(3y+4)$

$= (3y+4)(4y^2-1)$ ← still have y^2 so keep going. difference of 2 squares

$= (3y+4)(2y+1)(2y-1)$

56. $3r^3-27r^2-210r$ gcf $= 3r$

$= 3r(r^2-9r-70)$ $a=1$, so factor directly

$= 3r(r-14)(r+5)$

-70: $1\cdot 70$, $2\cdot 35$, $5\cdot 14$

58. y^9-y^5 gcf $= y^5$

$= y^5(y^4-1)$ difference of 2 squares $y^2\cdot y^2 = y^4$

$= y^5(y^2+1)(y^2-1)$ $y^2+1 \rightarrow$ prime

$= y^5(y^2+1)(y+1)(y-1)$ $y^2-1 \rightarrow$ difference of squares

64. $2y^5-128y^2$ gcf $= 2y^2$

$= 2y^2(y^3-64)$ difference of cubes

$= 2y^2(y-4)(y^2+4y+16)$