Factoring $ax^2 + bx + c$ (GCF)

Factoring Flowchart

How Many Terms?

Two Terms

Three Terms

Four Terms

Sum of Two Squares

Difference of Two Squares

Perfect Square Trinomial

Sum/Difference of Two Cubes
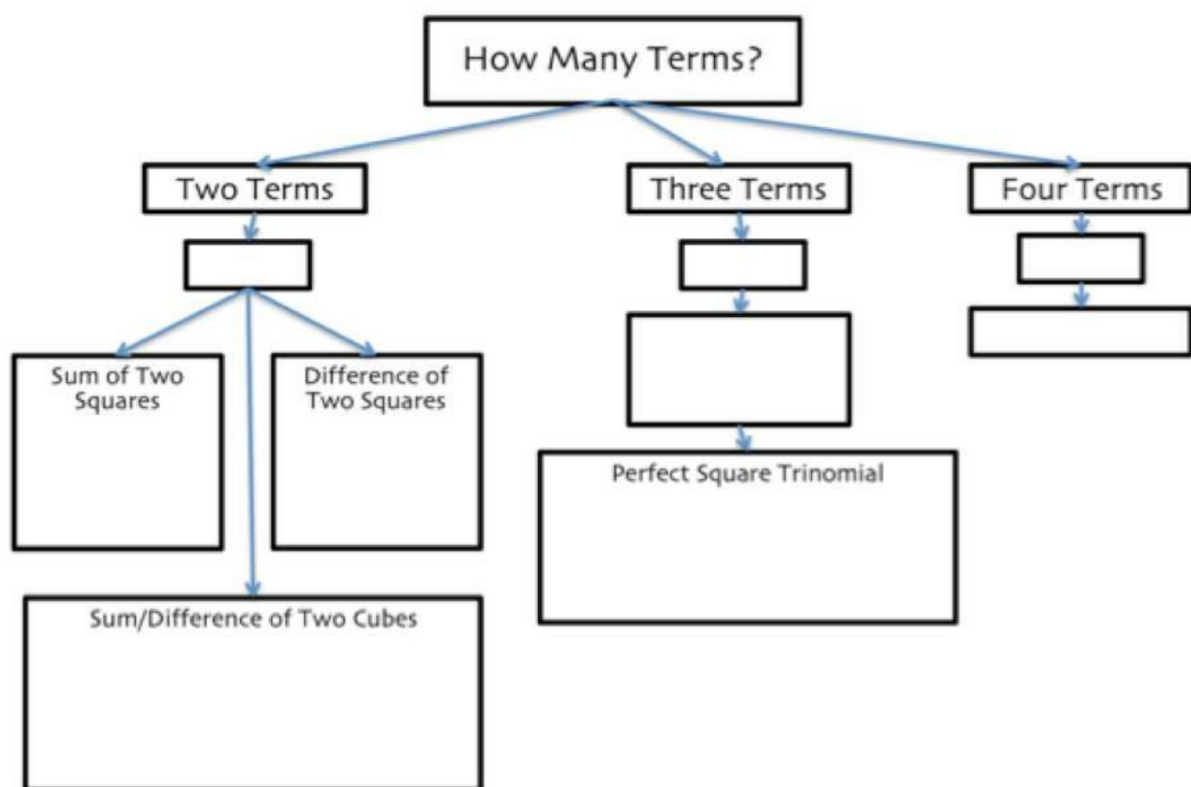
"GCF" –
"SOAP" –
Prime –

Does the trinomial have a GCF? State yes or no.

a) $x^2 - 2x - 12$

no

b) $3x^2 - 6x - 36$

gcf : 3

Does the trinomial have a GCF? State yes or no.

c) $x^3 + 3x^2 - 18x$

$g c f : \times$

d) $-3x^2 - 12xy + 36y^2$

-3

Factor completely.

e) $3x^2 - 27x - 30$

$3(x^2 - 9x - \underline{10})$

$3(x - 10)(x + 1)$

$\dfrac{-10}{\boxed{-10 \cdot 1}}$

$10 \cdot -1$

$5 \cdot -2$

$-5 \cdot 2$

f) $6x^2 + 72x + 192$

$6(x^2 + 12x + 32)$

$6(x + 8)(x + 4)$

$6\overline{)192} \;\; \dfrac{32}{}$

Factor completely.

g) $6x^2 + 12x - 144$

h) $5x^2 + 25x - 250$

Factor completely.

i) $4x^3 - 25x^2 + 25x$

j) $2x^2 + 28x + 96$

Factor completely.

k) $4x^2y - 25xy + 25y$

l) $6x^2 + 54x - 60$

Factor completely.

m) $2x^4 + 22x^3 + 56x^2$

$$2x^2(x^2 + 11x + 28)$$

$$2x^2(x+7)(x+4)$$

n) $\dfrac{2x^3}{2x} - \dfrac{24x^2}{2x} + \dfrac{64x}{2x} = 2x(x^2 - 12x + 32)$

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

Factor completely.

$\boxed{-8 \cdot 4}$
$8 \cdot -4$

o) $\dfrac{-2x^2}{-2} + \dfrac{8x}{-2} + \dfrac{64}{-2} = -2\left(x^2 - 4x - 32\right)$

$2(x - 8)(x + 4)$

p) $-4x^2 + 8x + 140$

Factor completely.

q) $3x^2 + 27xy - 30y^2$

r) $3x^2 - 3xy - 210y^2$

$3(x^2 + xy - 70)$

$1 \cdot 70$
$7 \ 10$
$2 \ 35$

Factor completely.

s) $2x^2 - 28xy + 96y^2$

t) $-3x^2 - 3xy + 54y^2$

Factor completely.

u) $2x^2 - 32$

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

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

$$x^2 \cancel{\;} -16$$

v) $50x^2 - 50y^2$

$$50(x^2 - y^2)$$

$$50(x+y)(x-y)$$

Factor $ax^2 + bx + c$

1.) $2x^2 + 9x + 7$

~~$(x + 7)(2x + 1)$~~

$(x + 1)(2x + 7)$

$\dfrac{\begin{array}{c}7x \\ 2x\end{array}}{9x}$!

$x^2 + 7x + 10$

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

$x^2 \qquad\qquad 10$

2.) $3x^2 + \underline{\underline{8x}} + 5$

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

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

$8x$:)

3.) $5x^2 + 6x + 1$

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

$1x^2 + 7x + 12$

$(x \quad)(x \quad)$

4.) $3x^2 + 16x + 5$

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

$15x$

x

$\overline{16x}$

⑤ $2x^2 + 17x + 8$

$1 \cdot 8$
$2 \cdot 4$

$\cancel{(2x + 4)(x + 2)}$

$\cancel{(2x + 8)(x + 1)}$

$(2x + 1)(x + 8)$