Factoring by Inspection
Now that we have learned what it means to factor a polynomial by using visual models (sharing and area), it’s time to learn how to factor without using tiles or drawing a picture.

We use the distributive property of multiplication over addition/subtraction:
\[ a(b + c) = ab + ac \]
as the main pattern for factoring:
\[ ab + ac = a(b + c) \]

Algebraically: Factor fully.

a) \[ 6k + 6 = 6(k + 1) \]
6 is the GCF of both terms so it appears as one factor
\( (k + 1) \) is the other factor

b) \[ 5 + 20h = 5(1 + 4h) \]
5 is the GCF
\( (1 + 4h) \) is the other factor

With numbers:
\[ 3(4 + 5) = 3(4) + 3(5) \]
\[ 3(4) + 3(5) = 3(4 + 5) \]

Algebraically:

Check:
\[ 4(x + 2y) = 4(x) + 4(2y) = 4x + 8y \]

To find the GCF in this type of problem:
1) The number factor
2) The highest power of each variable shared between the terms

c) \[ 4x + 8y = 4(x + 2y) \]
d) \[ 3a^2c - 18ac^3 = 3(a^2c - 6ac^3) = 3ac(a - 6c^2) \]