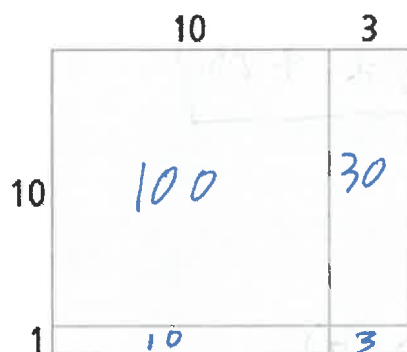


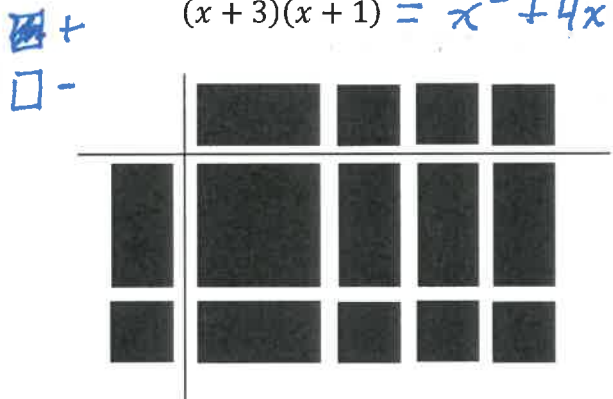
Date: _____

3.4.2 Polynomial MultiplicationExploring Polynomial MultiplicationMultiply: $13 \times 11 = 143$ Use the area model below to multiply 13×11 :

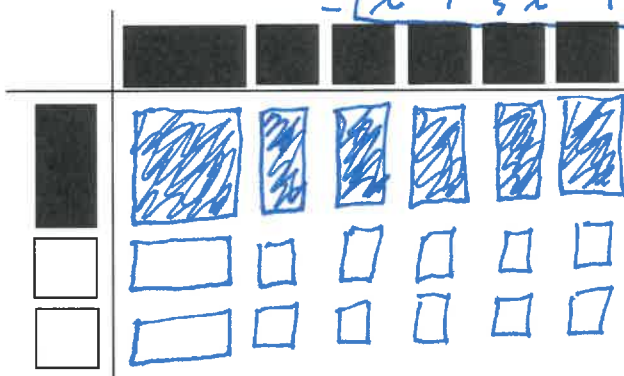
$$100 + 30 + 10 + 3 = 143$$

Use algebra tiles to determine the product:

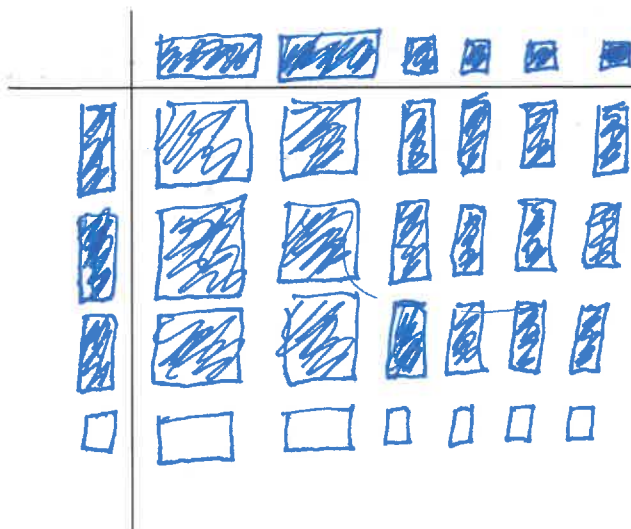
$$(x + 3)(x + 1) = x^2 + 4x + 3$$



$$(x + 5)(x - 2) = x^2 + 5x - 2x - 10 = x^2 + 3x - 10$$



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



$$= 6x^2 + 12x + (-2x) - 4$$

$$= 6x^2 + 10x - 4$$

Can also use the distributive property to multiply polynomials:

Ex. Simplify:

$$\begin{aligned}(x-2)(2x+1) &= x(2x+1) - 2(2x+1) \\ &= 2x^2 + x - 4x - 2 \\ &= \boxed{2x^2 - 3x - 2}\end{aligned}$$

$$\begin{aligned}(x-3)(x-5) &= x(x-5) - 3(x-5) \\ &= x^2 - 5x - 3x + 15 \\ &= \boxed{x^2 - 8x + 15}\end{aligned}$$

$$\begin{aligned}(5m-1)(2m-6) &= 5m(2m-6) - 1(2m-6) \\ &= 10m^2 - 30m - 2m + 6 \\ &= \boxed{10m^2 - 32m + 6}\end{aligned}$$

$$\begin{aligned}(b-4)^2 &= (b-4)(b-4) \\ &= b(b-4) - 4(b-4) \\ &= b^2 - 4b - 4b + 16 \\ &= \boxed{b^2 - 8b + 16}\end{aligned}$$

Can be extended to multiplication of larger polynomials:

Ex. Simplify:

$$\begin{aligned}(x+2)(2x^2-5x+1) &= x(2x^2-5x+1) + 2(2x^2-5x+1) \\ &= 2x^3 - 5x^2 + x + 4x^2 - 10x + 2 \\ &= \boxed{2x^3 - x^2 - 9x + 2}\end{aligned}$$
$$\begin{aligned}(q^2+q-2)(2q^2-3q+1) &= q^2(2q^2-3q+1) + q(2q^2-3q+1) - 2(2q^2-3q+1) \\ &= 2q^4 - 3q^3 + q^2 + 2q^3 - 3q^2 + q - 4q^2 + 6q - 2 \\ &= \boxed{2q^4 - q^3 - 6q^2 + 7q - 2}\end{aligned}$$