## Mathematics

## Distributive Property

## Try this

How do you calculate

## $23 \times 42 ?$

Why does your method work?

## Independent task

Match the equivalent expressions.

$$
(x+12)(x+2)
$$

$$
x^{2}+10 x+24
$$

$$
(x+8)(x+3)
$$

$$
x^{2}+14 x+24
$$



## Explore

$\square$

$$
(x+a)(x+b)
$$

Fill out the rest of the grid and give the expanded form of each expression.

What patterns can you spot?

Can you generalise these patterns?
$a$ increases in this direction

|  |  | $\begin{aligned} & (x+1)(x+1) \\ & = \end{aligned}$ |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  | $\begin{aligned} & x(x+2) \\ & = \end{aligned}$ | $\begin{aligned} & (x+1)(x+2) \\ & = \end{aligned}$ | $\begin{aligned} & (x+2)(x+2) \\ & = \end{aligned}$ |  |
| $\begin{aligned} & (x-1)(x+3) \\ & =x^{2}+2 x-3 \end{aligned}$ | $\begin{aligned} & x(x+3) \\ & =x^{2}+3 x \end{aligned}$ | $\begin{gathered} (x+1)(x+3) \\ =x^{2}+4 x+3 \end{gathered}$ | $\begin{aligned} & (x+2)(x+3) \\ & =x^{2}+5 x+6 \end{aligned}$ | $\begin{aligned} & (x+3)(x+3) \\ & =x^{2}+6 x+9 \end{aligned}$ |
|  | $\begin{aligned} & x(x+4) \\ & = \end{aligned}$ | $(x+1)(x+4)$ | $(x+2)(x+4)$ |  |
|  |  | $(x+1)(x+5)$ |  |  |

Explore a increases in this direction

$$
(x+a)(x+b)
$$

|  |  |  | $\begin{aligned} & (x+1)(x+1) \\ & = \end{aligned}$ |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | $\begin{aligned} & x(x+2) \\ & = \end{aligned}$ | $\begin{aligned} & (x+1)(x+2) \\ & = \end{aligned}$ | $\begin{aligned} & (x+2)(x+2) \\ & = \end{aligned}$ |  |
| $\begin{aligned} & \frac{T}{\tau} \\ & \stackrel{G}{n} \\ & \underset{\Omega}{n} \end{aligned}$ | $\begin{aligned} & (x-1)(x+3) \\ & =x^{2}+2 x-3 \end{aligned}$ | $\begin{aligned} & x(x+3) \\ & =x^{2}+3 x \end{aligned}$ | $\begin{aligned} & (x+1)(x+3) \\ & =x^{2}+4 x+3 \end{aligned}$ | $\begin{aligned} & (x+2)(x+3) \\ & =x^{2}+5 x+6 \end{aligned}$ | $\begin{aligned} & (x+3)(x+3) \\ & =x^{2}+6 x+9 \end{aligned}$ |
| $\begin{gathered} \stackrel{D}{1} \\ \stackrel{1}{+} \\ \stackrel{0}{0} \end{gathered}$ |  | $\begin{aligned} & x(x+4) \\ & = \end{aligned}$ | $\begin{aligned} & (x+1)(x+4) \\ & = \end{aligned}$ | $\begin{aligned} & (x+2)(x+4) \\ & = \end{aligned}$ |  |
| $\nabla$ |  |  | $\begin{aligned} & (x+1)(x+5) \\ & = \end{aligned}$ |  |  |

