

$$5x+4$$

$$21$$

$$\begin{array}{r} -5x^3+15x^2+90x \\ \hline 4x^2-9x-72 \\ -4x^2+12x+72 \\ \hline 3x \quad 0 \end{array}$$

What I want

$$\begin{array}{r} 5x \quad +4 \\ \hline x^2-3x-18) 5x^3-11x^2-99x-72 \\ -5x^3+15x^2+90x \\ \hline 4x^2-9x-72 \\ -4x^2+12x+72 \\ \hline 3x \end{array}$$

Test 1

$$\begin{array}{r} 5x \quad +4 \\ \hline x^2-3x-18 \Big| 5x^3-11x^2-99x-72 \\ -5x^3+15x^2+90x \\ \hline 4x^2-9x-72 \\ -4x^2+12x+72 \\ \hline 3x \quad 0 \end{array}$$

Test 2

$$\begin{array}{r} 5x \quad +4 \\ \hline x^2-3x-18 5x^3-11x^2-99x-72 \\ -5x^3+15x^2+90x \\ \hline 4x^2-9x-72 \\ -4x^2+12x+72 \\ \hline 3x \quad 0 \end{array}$$

Test 3

$$\begin{array}{r} 5x \quad +4 \\ \hline x^2-3x-18 \Big| 5x^3-11x^2-99x-72 \\ -5x^3+15x^2+90x \\ \hline 4x^2-9x-72 \\ -4x^2+12x+72 \\ \hline 3x \quad 0 \end{array}$$

$$\begin{array}{r}
 5x + 4 \\
 x^2 - 3x - 18 \left| \begin{array}{l} 5x^3 - 11x^2 - 99x - 72 \\ \hline -5x^3 + 15x^2 + 90x \\ 4x^2 - 9x - 72 \\ -4x^2 + 12x + 72 \\ 3x \end{array} \right.
 \end{array}$$

Test 10

$$\begin{array}{r}
 5x + 4 \\
 x^2 - 3x - 18 \left| \begin{array}{l} 5x^3 - 11x^2 - 99x - 72 \\ \hline -5x^3 + 15x^2 + 90x \\ 4x^2 - 9x - 72 \\ -4x^2 + 12x + 72 \\ 3x \end{array} \right.
 \end{array}$$

Test 11

$$\begin{array}{r}
 5x + 4 \\
 x^2 - 3x - 18 \left| \begin{array}{l} 5x^3 - 11x^2 - 99x - 72 \\ \hline -5x^3 + 15x^2 + 90x \\ 4x^2 - 9x - 72 \\ -4x^2 + 12x + 72 \\ 3x \end{array} \right.
 \end{array}$$

Test 12

$$\begin{array}{r}
 5x + 4 \\
 5x^3 - 11x^2 - 99x - 72 \quad 2 \\
 \quad -5x^3 \quad +15x^2 \quad +90x \\
 \hline
 \quad \quad 4x^2 \quad -9x \quad -72 \\
 \quad \quad -4x^2 \quad +12x \quad +72 \\
 \hline
 \quad \quad \quad 3x \quad \quad 0
 \end{array}
 \begin{array}{l}
 x^2 - 3x - 18 \\
 \\
 \\
 \\
 \end{array}$$

Test 13

$$5x + 4$$

$$\begin{array}{r}
 \begin{array}{r}
 x^2 - 3x - 18 \overline{) 5x^3 - 11x^2 - 99x - 72} \\
 \underline{-5x^3 + 15x^2 + 90x} \\
 4x^2 - 9x - 72 \\
 \underline{-4x^2 + 12x + 72} \\
 3x
 \end{array}
 \end{array}$$

Test 14

$$\begin{array}{r}
 \begin{array}{r}
 x^2 - 3x - 18 \overline{) 5x^3 - 11x^2 - 99x - 72} \\
 \underline{-5x^3 + 15x^2 + 90x} \\
 4x^2 - 9x - 72 \\
 \underline{-4x^2 + 12x + 72} \\
 3x
 \end{array}
 \end{array}$$

test 15

Hi Joanne,

I am getting in touch about the typesetting of my polynomial long division. I am using \LaTeX and my long division looks very much like the `polylongdiv` command from the `polynom` package. However, this is simply because that is how I want it to look. So I am sending you the code in advance so you can see I am doing it by hand and not relying on the package. Is this Okay?, Obviously not if the answer is correct, but just if I can use the same layout as the `polylongdiv` command.

$$\begin{array}{r}
 \begin{array}{r}
 x^2 - 3x - 18 \overline{) 5x^3 - 11x^2 - 99x - 72} \\
 \underline{-5x^3 + 15x^2 + 90x} \\
 4x^2 - 9x - 72 \\
 \underline{-4x^2 + 12x + 72} \\
 3x
 \end{array}
 \end{array}$$

Test 16

$$\begin{array}{r}
 5x + 4 \\
 x^2 - 3x - 18 \overline{) 5x^3 - 11x^2 - 99x - 72} \\
 \underline{-5x^3 + 15x^2 + 90x} \\
 4x^2 - 9x - 72 \\
 \underline{-4x^2 + 12x + 72} \\
 3x
 \end{array}$$

ideal

$$\begin{array}{r}
 5x + 4 \\
 x^2 - 3x - 18 \overline{) 5x^3 - 11x^2 - 99x - 72} \\
 \underline{-5x^3 + 15x^2 + 90x} \\
 4x^2 - 9x - 72 \\
 \underline{-4x^2 + 12x + 72} \\
 3x
 \end{array}$$

Next test can I generalise this?

Ideal

$$\begin{array}{r}
 9x^2 + 9x + 5 \\
 3x - 2 \overline{) 27x^3 + 9x^2 - 3x - 10} \\
 \underline{-27x^3 + 18x^2} \\
 27x^2 - 3x \\
 \underline{-27x^2 + 18x} \\
 15x - 10 \\
 \underline{-15x + 10} \\
 0
 \end{array}$$

Test 1

$$\begin{array}{r}
 9x^2 + 9x + 4 \\
 3x - 2 \overline{) 27x^3 + 9x^2 - 3x - 10} \\
 \underline{-27x^3 + 18x^2} \\
 27x^2 - 3x \\
 \underline{-27x^2 + 18x} \\
 15x - 10 \\
 \underline{-15x + 10} \\
 0
 \end{array}$$