

Synthetic Division

$$x+4=0$$

$$x=-4$$

zero $(x^2+7x+13) \div (x+4)$

-4	1	7	13
		-4	-12
	1	3	1

← Remainder

$$x+3 + \frac{1}{x+4}$$

$$(2x^2 + 3x - 4) \div (x - 2)$$

$$\begin{array}{r|rrr} 2 & 2 & 3 & -4 \\ & & 4 & 14 \\ \hline & 2 & 7 & 10 \end{array}$$

$$2x + 7 + \frac{10}{x-2}$$

$$(n^4 - 17n^3 + 81n^2 - 65n - 56) \div (n - 8)$$

8		1	-17	81	-65	-56
			8	-72	72	56
		1	-9	9	7	0

$$n^3 - 9n^2 + 9n + 7$$

$$(n^4 + 5n^3 - 6n + 3) \div (n+3)$$

$$\begin{array}{r|rrrrr} -3 & 1 & 5 & 0 & -6 & +3 \\ & & -3 & -6 & 18 & -36 \\ \hline & 1 & 2 & -6 & 12 & \boxed{-33} \end{array}$$

$$n^3 + 2n^2 - 6n + 12 - \frac{33}{n+3}$$

$$(x^5 + 5x^2 + x + 2) \div (x+1)$$

$$\begin{array}{r|rrrrrr} -1 & 1 & 0 & 0 & 5 & 1 & 2 \\ & & -1 & 1 & -1 & -4 & 3 \\ \hline & 1 & -1 & 1 & 4 & -3 & \boxed{5} \end{array}$$

$$x^4 - x^3 + x^2 + 4x - 3 + \frac{5}{x+1}$$

$$(3x^3 + 5x^2 + 8x + 7) \div (3x + 2)$$

$$\begin{array}{r|rrrr} -\frac{2}{3} & 3 & 5 & 8 & 7 \\ & & -2 & -2 & -4 \\ \hline & 3 & 3 & 6 & 3 \end{array}$$

$$\frac{3x^2 + 3x + 6}{3} + \frac{3}{3x+2}$$

3

$$x^2 + x + 2 + \frac{3}{3x+2}$$