Remainder

28. $(2x^3 + 6x - 4) \div (x + 4)$

$$
\begin{array}{r}
2x^2 - 8x + 38 \\
x+4 \overline{)\,2x^3 + 0x^2 + 6x - 4} \\
\underline{-2x^3 \mp 8x^2} \\
-8x^2 + 6x \\
\underline{+8x^2 \pm 32x} \\
38x - 4 \\
\underline{-38x \mp 152} \\
-156
\end{array}
$$

11.5 → Day 1 — synthetic division

→ Day 2 — applications of S.D

divide

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

$1x - 3 \quad \frac{3}{x-2}$

$x-2 \;\overline{)\; 1x^2 - 5x + 3}$

$-x^2 + 2x$

$-3x + 3$

$+3x \mp 6$

-3

$x - 2 = 0$

$x = 2$

2	1	−5	3
		+2	−6
	1	−3	−3

R

$x - 3 \quad \frac{3}{x-2}$

$$\frac{x^3 + 2x^2 - 1x - 3}{x + 3 = 0}$$

$$x = -3$$

$$\begin{array}{r|rrrr} -3 & 1 & 2 & -1 & -3 \\ & \downarrow & -3 & 3 & -6 \\ \hline & 1 & -1 & 2 & -9 \end{array}$$

$$x^2 - x + 2 - \frac{9}{x+3}$$

$$\frac{x^4 + 2x^2 - 5x + 1}{x + 1 = 0}$$

divide using Synthetic Division

$$\begin{array}{r|rrrrr} -1 & 1 & 0 & 2 & -5 & 1 \\ & \downarrow & -1 & 1 & -3 & 8 \\ \hline & 1 & -1 & 3 & -8 & 9 \end{array}$$

$$x^3 - x^2 + 3x - 8 + \frac{9}{x+1}$$

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

divide using synthetic division

$$\begin{array}{c|cccc} 2 & 1 & 3 & 0 & -2 & -5 \\ & & 2 & 10 & 20 & 36 \\ \hline & 1 & 5 & 10 & 18 & \boxed{31} \end{array}$$

$$x^3 + 5x^2 + 10x + 18 + \frac{31}{x-2}$$

$$(x^2 - 5x - 5x^3 + x^4) \div (5+x)$$

$$x^4 - 5x^3 + x^2 - 5x + 0 \quad \div \quad (1x+5)=0$$

$$x = -5$$

$$\begin{array}{r|rrrrr} -5 & 1 & -5 & 1 & -5 & 0 \\ & & -5 & 50 & -255 & 1300 \\ \hline & 1 & -10 & 51 & -260 & 1300 \end{array}$$

$$x^3 - 10x^2 + 51x - 260 + \frac{1300}{x+5}$$

$(3x^3 + 2x^2 - 4x + 1) \div (1x - \frac{1}{3})$

$\frac{1}{3}$ | 3 2 −4 1

1 1 −1

3 3 −3 0

$3x^2 + 3x - 3$