

< 体系数学3 数式・関数編 >

p.21 ~ 整式の割り算

$$\begin{array}{r}
 18 \\
 7 \overline{) 129} \\
 \underline{7 \times 1} \\
 59 \\
 \underline{7 \times 8} \\
 3
 \end{array}$$

(割る数より低い数)

$$\begin{aligned}
 (\text{割られる数}) &= (\text{割る数}) \times (\text{商}) + (\text{余り}) \\
 129 &= 7 \times 18 + 3
 \end{aligned}$$

$$\begin{array}{r}
 x+3 \\
 x^2+2x-2 \overline{) x^3+5x^2+7x-5} \\
 \underline{[x^3+2x^2-2x]} \\
 3x^2+9x-5 \\
 \underline{[3x^2+6x-6]} \\
 3x+1
 \end{array}$$

(割る式より低い次数)

$$\begin{aligned}
 (\text{割られる式}) &= (\text{割る式}) \times (\text{商}) + (\text{余り}) \\
 x^3+5x^2+7x-5 &= (x^2+2x-2)(x+3) + 3x+1
 \end{aligned}$$

$$\begin{array}{r}
 2x+4 \\
 x^2-2x-1 \overline{) 2x^3 } \\
 \underline{2x^3-4x^2-2x} \\
 4x^2-9x-7 \\
 \underline{4x^2-8x-4} \\
 -x-3
 \end{array}$$

欠落した次数は
空けておく

$$2x^3-11x-7 = (x^2-2x-1)(2x+4) - x-3$$

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p.28 繁分式・連分式

$$\begin{aligned}
 1 - \frac{1}{1 - \frac{1}{1 - \frac{1}{x}}} &= \frac{1}{1 - \frac{1}{1 - \frac{1}{(1 - \frac{1}{x}) \times x}}} \quad \begin{array}{l} \times x \\ (1 - \frac{1}{x}) \times x \end{array} \\
 &= \frac{1}{1 - \frac{1}{1 - \frac{x}{x-1}}} \quad \begin{array}{l} \times (x-1) \\ (1 - \frac{x}{x-1}) \times (x-1) \end{array} \quad \begin{array}{l} * \text{内側の分数の分母を} \\ \text{全体の分母分子にかける} \end{array} \\
 &= \frac{1}{1 - \frac{x-1}{(x-1)-x}} \\
 &= \frac{1}{1 - \frac{x-1}{-1}} = \frac{1}{1 + (x-1)} = \frac{1}{x}
 \end{aligned}$$

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p.30 指数の拡張

$$\begin{array}{l}
 2^{\textcircled{2}} = \frac{1}{4} \quad \leftarrow \times \frac{1}{2} \\
 2^{\textcircled{1}} = \frac{1}{2} \quad \leftarrow \times \frac{1}{2} \\
 2^{\textcircled{0}} = 1 \quad \leftarrow \times \frac{1}{2} \\
 2^{\textcircled{1}} = 2 \quad \leftarrow \times 2 \\
 2^{\textcircled{2}} = 4 \quad \leftarrow \times 2 \\
 2^{\textcircled{3}} = 8 \quad \leftarrow \times 2
 \end{array}$$

0乗, マイナス乗への拡張

$$\begin{aligned}
 a^{-n} &= \frac{1}{a^n} \quad (\text{マイナス乗は逆数}) \\
 a^0 &= 1 \quad (0乗は1)
 \end{aligned}$$

指数0が1増えると、値は2倍
指数が1減ると、値は $\frac{1}{2}$ 倍