◎ 対称式

基本対称式 $x+y$, xy を用いて以下を表せ

(1) $x^2+y^2 = (x+y)^2 - 2xy$

$(x+y)^2 = x^2+2xy+y^2$

(2) $x^3+y^3 = (x+y)^3 - 3xy(x+y)$

$(x+y)^3 = x^3 + \underbrace{3x^2y+3xy^2}_{3xy(x+y)} + y^3$

(3) $x^4+y^4 = (x^2+y^2)^2 - 2(xy)^2$

$(x^2+y^2)^2 = x^4+2x^2y^2+y^4$

(4) $x^5+y^5 = (x^2+y^2)(x^3+y^3) - (xy)^2(x+y)$

$(x^2+y^2)(x^3+y^3) = x^5 + \underbrace{x^2y^3+x^3y^2}_{x^2y^2(x+y)} + y^5$

(5) $x-y \leftarrow \sqrt{\ } \ (x-y)^2 = (x+y)^2 - 4xy$

$(x-y)^2 = x^2-2xy+y^2 \,/\, +4xy = (x+y)^2$

(6) $x^2-y^2 = (x+y)(x-y)$

(7) $x^3-y^3 = (x-y)^3 + 3xy(x-y)$

$(x-y)^3 = x^3 \underbrace{-3x^2y+3xy^2}_{-3xy(x-y)} - y^3$

(8) $x^4-y^4 = (x^2+y^2)(x^2-y^2)$

$= (x^2+y^2)(x+y)(x-y)$

◎ 整数部分と小数部分の問題

$\dfrac{2\sqrt{11}+3}{4}$ の整数部分 a と小数部分 b を求めよ.

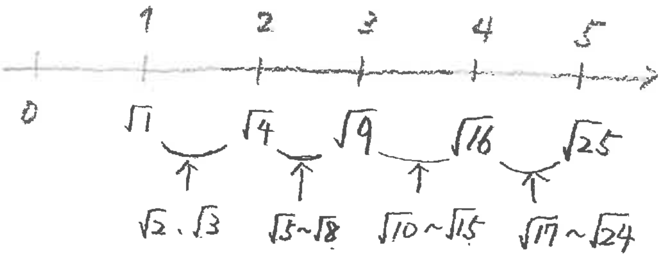
× $3 < \sqrt{11} < 4$

$6 < 2\sqrt{11} < 8$

$\sqrt{5} = \underbrace{2}_{a}.\underbrace{236\cdots}_{b}$

$b = \sqrt{5} - 2$

○ $2\sqrt{11} = \sqrt{44}$



$6 < \sqrt{44} < 7$

$9 < \sqrt{44} + 3 < 10$

$\underbrace{\dfrac{9}{4}}_{2.25} < \underbrace{\dfrac{\sqrt{44}+3}{4}}_{2.\sim} < \underbrace{\dfrac{10}{4}}_{2.5}$

⇓

$a = 2$ //

$b = \dfrac{2\sqrt{11}+3}{4} - 2$

$= \dfrac{2\sqrt{11}+3-8}{4}$

$= \dfrac{2\sqrt{11}-5}{4}$ //