④ $\dfrac{-i\,(9+6i)}{(2-i)} \not{*} \dfrac{2+i}{2+i}$

$= \dfrac{(-9i+6)\,(2+i)}{(2-i)\,(2+i)} \quad = \quad \text{——}$

⑨ $\underbrace{(3-1)\,(3+1)}\ (3^2+1)\,(3^4+1)\,(3^8+1) \ \text{-} \ \text{---} \ (3^{64}+1)$

$(3-1)$

3^2-1

3^4-1

$3^{128}-1$

$\dfrac{3^{128}-1}{2}$

② $\left(\sqrt{13} - \sqrt{12}\right) \dfrac{\sqrt{13}+\sqrt{12}}{\sqrt{13}+\sqrt{12}}$, $\left(\sqrt{14} - \sqrt{13}\right) \dfrac{\sqrt{14}+\sqrt{13}}{\sqrt{14}+\sqrt{13}}$

$\dfrac{1}{\sqrt{13}+\sqrt{12}}$, $\dfrac{1}{\sqrt{14}+\sqrt{13}}$

④ (ii) $\left(\dfrac{4i^3 - i}{2i+1}\right)^2 = \left(\dfrac{4(-i) - i}{2i+1}\right)^2 = \dfrac{(-5i)^2}{(2i+1)^2}$

$= \dfrac{-25}{4i^2+1+4i} = \dfrac{-25}{4i-3}$

① $x^2 + 3x = t$

$(t+1)(t-3) \geq 5$

$t^2 - 2t - 3 \geq 5$

$t^2 - 2t - 8 \geq 0$

$(t-4)(t+2) \geq 0$

$(x^2 + 3x - 4)(x^2 + 3x + 2) \geq 0$

② $3a^2 + 27b^2 - 18ab$
$\qquad + 5c^2 - 30c + 237$

$= 3(a^2 + 9b^2 - 6ab)$

$\qquad + 5(c^2 - 6c + 9)$

$\qquad\qquad - 5(9) + 237$

$= 3(a-3b)^2 + 5(c-3)^2 + 192$

$= 0$

final
an

③

Dividend $=$ div. qu $+R.$

$$P(x) = \underbrace{(x-2)(x-3)\ q(x)}_{} + \underbrace{ax+b}_{}$$

put $x=2$

$$P(2) = 2a+b \quad \gg \quad 3 = 2a+b$$

put $x=3$

$$2 = 3a+b$$

$S \rightarrow 0, 1, 2, 3, 4$

$x^2 \rightarrow \quad 0,\ \text{const},$

linear

⑤

$$P(x) = \frac{1}{x+1} \quad ✓$$

$$P(x)(x+1) = 1$$

$$(x+1)P(x) - 1 = 0$$
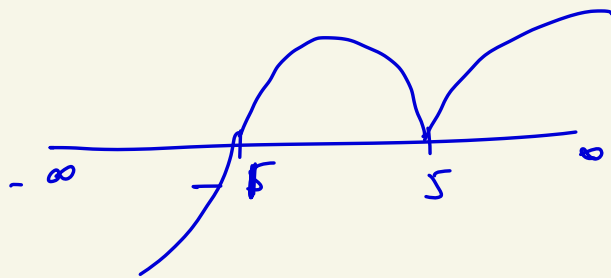
$$(x+1)P(x) - 1 = a(x-1)(x-2)(x-3)(x-4)$$

put $x = -1$

$$-1 = a(-2)(-3)(-4)(-5)$$

$$\boxed{a = -\frac{1}{120}} \quad ✓$$

→ put $x = 5$

⑦
$$\frac{x-5}{(x^2+x+5)(x-5)(x+1)} > 0$$

⑥ $P(7) = a(7^7) + b(7^5) + c(7^3) + 3$

$P(-7) = a(-7)^7 + b(-7)^5 + c(-7)^3 + 3$

add

$P(7) + P(-7) = 6$

② $x|x| + 7x - 8 = 0$

$x < 0$

$-x^2 + 7x - 8 = 0$

$x \geq 0$

$x(+x) + 7x - 8 = 0$

⑦ $x^2 - |x| + 4 = 2x^2 - 3|x| + 1$

$|x| \rightarrow \boxed{\pm x}$

$|x|^2 \Rightarrow x^2$

⑥ $\left| |x-1| - 2 \right| = |x-3|$

$\left(|x-1| - 2 \right)^2 = (x-3)^2$

I 31

$-3 < \qquad < 3$

$-3 < \dfrac{x^2 - 3x - 1}{\boxed{x^2 + x + 1}}$ $\cap$ $\dfrac{x^2 - 3x - 1}{x^2 + x + 1} > 3$

⑩ $|\ \underbrace{\ \ }\ | + |\ \ | + (\ )^2 \lesseqqgtr 0$

$x = 1$; $y = 2$ $z = 3$

⑨ $-1 \leq \dfrac{x^2 - 5x + 4}{x^2 - 4} \leq 1$

⑧

⑤ (ii) $\left(2^{-1}\right)^{\log_2 5}$

$= 2^{\log_2 (5^{-1})}$

$= 5^{-1} = \frac{1}{5}$

, —

⑥ $E = \dfrac{\sin^2 10 + \cos^2 10}{+ \sin^2 70 + \cos^2 70} + \dfrac{2\sin 10 \cos 10}{2 \sin 10 \cos 10} = 1 + 1 = 2$

$\log_{0.5} E = \log_{0.5}(2) = \log_{1/2}(2) = \log_{2^{-1}}(2)$

$= (-1)\, \log_2 2 = (-1)$

---

⑨ $\log_3 5 = x \qquad \log_{25} 11 = y$

$\log_3\left(\dfrac{11}{3}\right) = \log_3 11 - \log_3 3$

$= \underbrace{\log_3 11}_{} - 1$

$= 2xy - 1$

$x = \dfrac{\log 5}{\log 3}$

$y = \dfrac{\log 11}{2 \log 5} \Rightarrow 2y = \dfrac{\log 11}{\log 5}$

$x \cdot (2y) = \dfrac{\log 5}{\log 3} \cdot \dfrac{\log 11}{\log 5} = \log_3 11$

⑧

$$a = \left(3^{-2}\right)^{-2\log_3 7} = 3^{4\log_3 7} = 3^{\log_3(7^4)} = 7^4$$

$$b = 2^{-\log_{2^{-1}} 7} = 7$$

⑰

(14)

$K =$ _____

$\log_e K = (\ln y - \ln z)(\ln x) + (\ln z - \ln x) \ln y$

$\qquad\qquad\qquad\qquad\qquad\qquad + (\qquad) \ln z$

$\ln K = 0$

$K = e^0 = 1$

⑥

$$x^{\sqrt{x}} = (\sqrt{x})^x$$

$$\sqrt{x} \, \ln x = x \, \ln(\sqrt{x})$$

$$\sqrt{x} \, \ln x = \frac{x}{2} (\ln x)$$

$$\ln x \left(\sqrt{x} - \frac{x}{2} \right) = 0$$

$$\ln x = 0$$

$$\boxed{x = 1}$$

$$\rho \sqrt{\rho \sqrt{\rho \sqrt{\rho}}}$$

$$\left(\rho^{\sqrt{\rho}} \right)^{\frac{1}{\rho}} \, \rho^{\frac{1}{\rho}}$$

$$\rho^{\frac{1}{\rho} \cdot \frac{1}{\rho} \cdots}$$

$$\rho$$

$$\left| x - |4-x| \right| = 4 + 2x$$

$$x - |4-x| = +4 + 2x$$

$$4 - x \geq 0 \implies x \leq 4$$

$$x - (4-x) = 4 + 2x$$

$$\boxed{|x| < a}$$

$$-a < x < a$$

$$x - |4-x| = -4 - 2x$$

$$4 - x \leq 0 \implies x > 4$$

$$x + (4-x) = -4 - 2x$$

$$\log_{(1-x)}\left(\frac{3}{2}\right) = \frac{1}{2}$$

$$(1-x)^{1/2} = \frac{3}{2}$$

$$\sqrt{1-x} = \frac{3}{2}$$

$$1-x = \frac{9}{4}$$