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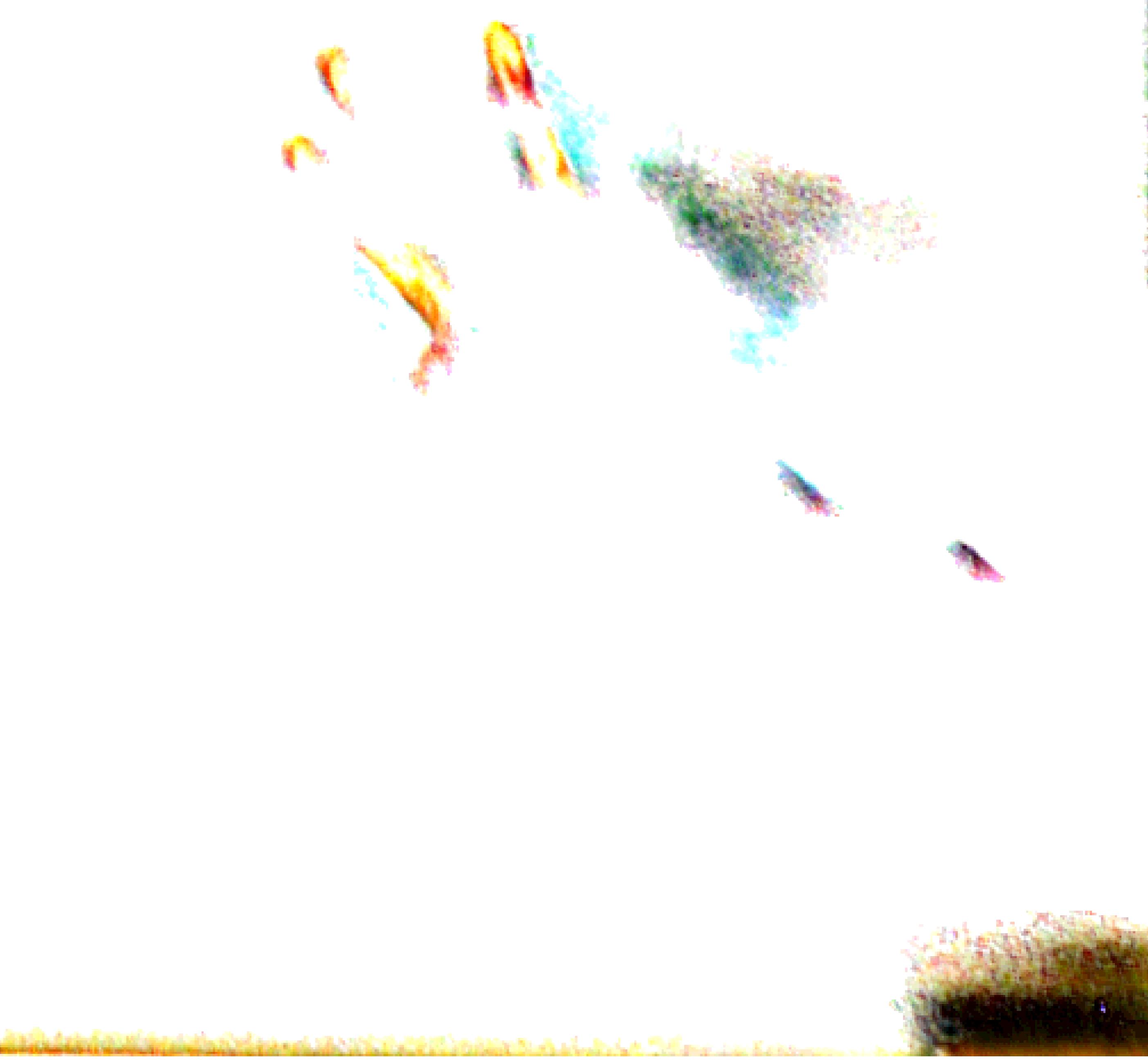
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321 . 278

321 · 278

$$(3x^2 + 2x + 1) \cdot (2x^2 + 7x + 8)$$

321 · 278

$$(3x^2 + 2x + 1) \cdot (2x^2 + 7x + 8)$$

$$321 \cdot 278$$

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$$321 \cdot 278$$

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321 · 278

$$(3x^2 + 2x + 1) \cdot (2x^2 + 7x + 8)$$

(1, 2, 3)

321 · 278

$$(3x^2 + 2x + 1) \cdot (2x^2 + 7x + 8)$$

(1, 2, 3)

$$321 \cdot 278$$

$$(3x^2 + 2x + 1) \cdot (2x^2 + 7x + 8)$$

c_i

$$321 \cdot 278$$

$$(3x^2 + 2x + 1) \cdot (2x^2 + 7x + 8)$$

$$321 \cdot 278$$

$$(3x^2 + 2x + 1) \cdot (2x^2 + 7x + 8)$$

$$c_3 = a_2 b_1$$

$$c_3 x^3$$

$$321 \cdot 278$$

$$\left(\overline{3x^2 + 2x + 1} \right) \cdot \left(\overline{2x^2 + 7x + 8} \right)$$

$$c_3 = q_2 b_1 + q_1 \cdot b_2 = 3 \cdot 7 + 2 \cdot 2 \\ = \textcircled{25}$$

$$c_3 x^3$$

$$321 \cdot 278$$

$$\left(\overline{3x^2 + 2x + 1} \right) \cdot \left(\overline{2x^2 + 7x + 8} \right)$$

$$c_3 = q_2 b_1 + q_1 \cdot b_2 = 3 \cdot 7 + 2 \cdot 2 \\ = \boxed{25}$$

$$c_3 x^3$$

$$321 \cdot 278$$

$$\left(\overline{3x^2 + 2x + 1} \right) \cdot \left(\overline{2x^2 + 7x + 8} \right)$$

$$c_3 = q_2 b_1 + q_1 \cdot b_2 = 3 \cdot 7 + 2 \cdot 2 \\ = 25$$

$$c_3 x^3$$

$$321 \cdot 278$$

$$\left(\overline{3x^2 + 2x + 1} \right) \cdot \left(\overline{2x^2 + 7x + 8} \right)$$

$$p \rightarrow (n_0, p(n_0)), \dots, (n_{n-1}, p(n_{n-1}))$$

$$q \rightarrow (n_0, q(n_0)), \dots, (n_{n-1}, q(n_{n-1})).$$

$$p+q \rightarrow (n_0, p(n_0) + q(n_0)), \dots, (n_{n-1}, \frac{p(n_{n-1}) + q(n_{n-1})}{2})$$

321 . 278

$$\left(\overline{3x^2 + 2x + 1} \right) \cdot \left(\overline{2x^2 + 7x + 8} \right)$$

$$P \rightarrow (n_0, p(n_0)), \dots, (n_{n-1}, p(n_{n-1}))$$

$$q \rightarrow (n_0, q(n_0)), \dots, (n_{n-1}, q(n_{n-1}))$$

$$p+q \rightarrow (n_0, p(n_0) + q(n_0)), \dots, (n_{n-1}, \frac{p(n_{n-1})}{q(n_{n-1})})$$

321 . 278

$$\left(\begin{array}{c} \overline{3x^2} + 2x + 1 \\ \uparrow \\ Q_2 \\ \uparrow \\ Q_1 \\ \uparrow \\ Q_0 \end{array} \right) \cdot \left(\begin{array}{c} 2x^2 + \overline{7x} + 8 \\ \uparrow \\ b_2 \\ \uparrow \\ b_1 \\ \uparrow \\ b_0 \end{array} \right)$$

$$p \rightarrow (n_0, p(n_0)), \dots, (n_{n-1}, p(n_{n-1}))$$

$$q \rightarrow (n_0, q(n_0)), \dots, (n_{n-1}, q(n_{n-1}))$$

$$p \cdot q \rightarrow (n_0, p(n_0) \cdot q(n_0)), \dots, (n_{n-1}, \frac{p(n_{n-1})}{q(n_{n-1})})$$

321 . 278

$$\left(\overline{3x^2 + 2x + 1} \right) \cdot \left(\overline{2x^2 + 7x + 8} \right)$$

$\begin{matrix} \uparrow & \uparrow & \uparrow \\ Q_2 & Q_1 & Q_0 \end{matrix}$ $\begin{matrix} \uparrow & \uparrow & \\ b_2 & b_1 & b_0 \end{matrix}$

$$p \rightarrow (n_0, p(n_0)), \dots, (n_{n-1}, p(n_{n-1}))$$

$$q \rightarrow (n_0, q(n_0)), \dots, (n_{n-1}, q(n_{n-1}))$$

$$p \cdot q \sim (n_0, p(n_0) \cdot q(n_0)), \dots, (n_{n-1}, \frac{p(n_{n-1})}{q(n_{n-1})})$$

$$321 \cdot 278$$

$$\left(\overline{3x^2 + 2x + 1} \right) \cdot \left(\overline{2x^2 + 7x + 8} \right)$$

$\begin{matrix} \uparrow & \uparrow & \uparrow \\ Q_2 & Q_1 & Q_0 \end{matrix}$ $\begin{matrix} \uparrow & \uparrow & \\ b_2 & b_1 & b_0 \end{matrix}$

2^{n-2}

$$p \rightarrow (v_0, p(v_0)), \dots, (v_{n-1}, p(v_{n-1}))$$

2^{n-2}

$$q \rightarrow (v_0, q(v_0)), \dots, (v_{n-1}, q(v_{n-1}))$$

$$p \cdot q \sim (v_0, p(v_0) \cdot q(v_0)), \dots, (v_{n-1}, \frac{p(v_{n-1})}{q(v_{n-1})})$$

$$321 \cdot 278$$

$$\left(\overline{3x^2 + 2x + 1} \right) \cdot \left(\overline{2x^2 + 7x + 8} \right)$$

$\begin{matrix} \uparrow & \uparrow & \uparrow \\ Q_2 & Q_1 & Q_0 \end{matrix}$ $\begin{matrix} \uparrow & \uparrow & \\ b_2 & b_1 & b_0 \end{matrix}$

$$2^{n-1} \rightarrow p \rightarrow (r_0, p(r_0)), \dots, (r_{n-1}, p(r_{n-1}))$$

$$2^{n-1} \rightarrow q \rightarrow (r_0, q(r_0)), \dots, (r_{n-1}, q(r_{n-1}))$$

$$p \cdot q \rightarrow (r_0, p(r_0) \cdot q(r_0)), \dots, (r_{n-1}, \frac{p(r_{n-1})}{q(r_{n-1})})$$

$$321 \cdot 278$$

$$\left(\overline{3x^2 + 2x + 1} \right) \cdot \left(\overline{2x^2 + 7x + 8} \right)$$

$\begin{matrix} \uparrow & \uparrow & \uparrow \\ Q_2 & Q_1 & Q_0 \end{matrix}$ $\begin{matrix} \uparrow & \uparrow & \\ b_2 & b_1 & b_0 \end{matrix}$

$$z_n \rightarrow p \rightarrow (n_0, p(n_0)), \dots, (n_{n-1}, p(n_{n-1}))$$

$$z_n \rightarrow q \rightarrow (n_0, q(n_0)), \dots, (n_{n-1}, q(n_{n-1}))$$

$$p \cdot q \rightarrow (n_0, p(n_0) \cdot q(n_0)), \dots, (n_{n-1}, \frac{p(n_{n-1})}{q(n_{n-1})})$$

$$321 \cdot 278$$

$$\left(\overline{3x^2 + 2x + 1} \right) \cdot \left(\overline{2x^2 + 7x + 8} \right)$$

$\begin{matrix} \uparrow & \uparrow & \uparrow \\ Q_2 & Q_1 & Q_0 \end{matrix}$ $\begin{matrix} \uparrow & \uparrow & \\ b_2 & b_1 & b_0 \end{matrix}$

$$z_n \rightarrow p \rightarrow (n_0, p(n_0)), \dots, (n_{n-1}, p(n_{n-1}))$$

$$z_n \rightarrow q \rightarrow (n_0, q(n_0)), \dots, (n_{n-1}, q(n_{n-1}))$$

$$p \cdot q \rightarrow (n_0, p(n_0) \cdot q(n_0)), \dots, (n_{n-1}, \frac{p(n_{n-1})}{q(n_{n-1})})$$

321 · 278

$$\left(\overline{3x^2 + 2x + 1} \right) \cdot \left(\overline{2x^2 + 7x + 8} \right)$$

$\begin{matrix} \uparrow & \uparrow & \uparrow \\ Q_2 & Q_1 & Q_0 \end{matrix}$ $\begin{matrix} \uparrow & \uparrow & \\ b_2 & b_1 & b_0 \end{matrix}$

$$z_n \longrightarrow p \rightarrow (n_0, p(n_0)), \dots, (n_{n-1}, p(n_{n-1}))$$

$$z_n \longrightarrow q \rightarrow (n_0, q(n_0)), \dots, (n_{n-1}, q(n_{n-1}))$$

$$p \cdot q \rightarrow (n_0, p(n_0) \cdot q(n_0)), \dots, (n_{n-1}, \frac{p(n_{n-1})}{q(n_{n-1})})$$

$$\begin{array}{c} p(x) \\ q(x) \\ \gamma (x_0, \dots, x_{n-1}) \end{array}$$

$$321 \cdot 278$$

$$\left(\overline{3x^2 + 2x + 1} \right) \cdot \left(\overline{2x^2 + 7x + 8} \right)$$

$\begin{matrix} \uparrow & \uparrow & \uparrow \\ Q_2 & Q_1 & Q_0 \end{matrix} \qquad \begin{matrix} \uparrow & \uparrow & \uparrow \\ b_2 & b_1 & b_0 \end{matrix}$

$$\begin{matrix} x_0 & \circled{p(x_0)} \\ \vdots & \\ x_{n-1} & p(x_{n-1}) \end{matrix} \rightarrow P \rightarrow (x_0, p(x_0)), \dots, (x_{n-1}, p(x_{n-1}))$$

$$\rightarrow q \rightarrow (x_0, q(x_0)), \dots, (x_{n-1}, q(x_{n-1}))$$

$$P \cdot q \rightarrow (x_0, p(x_0) \cdot q(x_0)), \dots, (x_{n-1}, \frac{p(x_{n-1})}{q(x_{n-1})})$$

$p(x)$
 $q(x)$
 $\rightarrow (a_0, \dots, a_{n-1})$

$$321 \cdot 278$$

$$\left(\overline{3x^2 + 2x + 1} \right) \cdot \left(\overline{2x^2 + 7x + 8} \right)$$

$\begin{matrix} \uparrow & \uparrow & \uparrow \\ q_2 & q_1 & q_0 \end{matrix}$

 $\begin{matrix} \uparrow & \uparrow & \\ b_2 & b_1 & b_0 \end{matrix}$

$\overset{2n-1}{\curvearrowright} \quad \overset{n-1}{\curvearrowright} \quad p \rightarrow \quad \rightarrow (r_0, p(r_0)), \dots, (r_{n-1}, p(r_{n-1}))$
 $\overset{2n-1}{\curvearrowright} \quad \overset{n-1}{\curvearrowright} \quad q \rightarrow \quad (r_0, q(r_0)), \dots, (r_{n-1}, q(r_{n-1}))$
 $\overset{2n-2}{\curvearrowright} \quad p \cdot q \rightarrow \quad (r_0, p(r_0) \cdot q(r_0)), \dots, (r_{n-1}, \frac{p(r_{n-1})}{q(r_{n-1})})$
 $\boxed{a_{n-1}}$

$p(x)$
 $q(x)$
 $\gamma (q_0, \dots, q_{n-1})$

$$321 \cdot 278$$

$$\left(\overline{3x^2 + 2x + 1} \right) \cdot \left(\overline{2x^2 + 7x + 8} \right)$$

$\overbrace{}^{q_2}$ $\overbrace{}^{q_1}$ $\overbrace{}^{q_0}$ $\overbrace{}^{b_2}$ $\overbrace{}^{b_1}$ $\overbrace{}^{b_0}$

$$\begin{array}{c}
2n-1 \quad n-1 \quad p \rightarrow (r_0, p(r_0)), \dots, (r_{n-1}, p(r_{n-1})) \\
2n-1 \quad n-1 \quad q \rightarrow (r_0, q(r_0)), \dots, (r_{n-1}, q(r_{n-1})) \\
2n-2 \quad p \cdot q \rightarrow (r_0, p(r_0) \cdot q(r_0)), \dots, (r_{n-1}, \frac{p(r_{n-1})}{q(r_{n-1})})
\end{array}$$

$\boxed{q_{n-1}}$

$$P(x) = \sum_{i=0}^n a_i x^i$$

$$P(n)$$

$$321 \cdot 278$$

$$\left(\overline{3x^2 + 2x + 1} \right) \cdot \left(\overline{2x^2 + 7x + 8} \right)$$

$\begin{matrix} \uparrow & \uparrow & \uparrow \\ a_2 & a_1 & a_0 \end{matrix}$ $\begin{matrix} \uparrow & \uparrow & \\ b_2 & b_1 & b_0 \end{matrix}$

$$(N_0, P(N_0)), \dots, (N_{n-1}, P(N_{n-1}))$$

$$(N_0, Q(N_0)), \dots, (N_{n-1}, Q(N_{n-1}))$$

$$((N_0, P(N_0) \cdot Q(N_0)), \dots, (N_{n-1}, \frac{P(N_{n-1})}{Q(N_{n-1})}))$$

$$P(x) = \sum_{i=0}^n a_i x^i$$

$$P(n)$$

$$a_0 + a_1 \cdot n + a_2 \cdot n^2$$

$$321 \cdot 278$$

$$\left(\overline{3x^2 + 2x + 1} \right) \cdot \left(\overline{2x^2 + 7x + 8} \right)$$

$$(n_0, P(n_0)), \dots, (n_{n-1}, P(n_{n-1}))$$

$$(n_0, q(n_0)), \dots, (n_{n-1}, q(n_{n-1}))$$

$$(n_0, P(n_0) \cdot q(n_0)), \dots, (n_{n-1}, \frac{P(n_{n-1})}{q(n_{n-1})})$$

$$P(x) = \sum_{i=0}^n a_i x^i$$

$P(n)$

$$a_0 + a_1 \cdot n + a_2 \cdot n^2$$

$$+ a_3 \cdot n^3$$

$\rightarrow O(n)$

$$321 \cdot 278$$

$$\left(\overline{3x^2 + 2x + 1} \right) \cdot \left(\overline{2x^2 + 7x + 8} \right)$$

$$(n_0, P(n_0)), \dots, (n_{n-1}, P(n_{n-1}))$$

$$(n_0, q(n_0)), \dots, (n_{n-1}, q(n_{n-1}))$$

$$(n_0, P(n_0) \cdot q(n_0)), \dots, (n_{n-1}, \frac{P(n_{n-1})}{q(n_{n-1})})$$

(N_0, w_0) (N_1, w_1) (N_2, w_2)

$\{ \alpha_i, \beta_i, \gamma_i \}$

β_0

β_3

$\alpha_0, \alpha_1, \alpha_2$

$\beta_0, \beta_1, \beta_2$

$$(n_0, p(n_0)) \quad (n_1, p(n_1)) \quad (n_2, p(n_2))$$

$$p(x) = p(n_0)$$

$$+ p(n_1) \cdot (x - n_0)$$

$$+ p(n_2) \cdot (x - n_0)$$

$$(r_0, p(r_0)) \quad (r_1, p(r_1)) \quad (r_2, p(r_2))$$

$$p(x) = p(r_0) \cdot \frac{(x-r_1)(x-r_2)}{(r_0-r_1)(r_0-r_2)} +$$

$$+ p(r_1) \cdot \frac{(x-r_0)(x-r_2)}{(r_1-r_0)(r_1-r_2)} +$$

$$+ p(r_2) \cdot \frac{(x-r_0)(x-r_1)}{(r_2-r_0)(r_2-r_1)}$$

$$(N_0, p(N_0)) \quad (N_1, p(N_1)) \quad (N_2, p(N_2))$$

$$P(X) = P(N_0) \cdot \frac{(X - N_1)(X - N_2)}{(N_0 - N_1)(N_0 - N_2)} +$$

$$+ P(N_1) \cdot \frac{(X - N_0)(X - N_2)}{(N_1 - N_0)(N_1 - N_2)} +$$

$$+ P(N_2) \cdot \frac{(X - N_0)(X - N_1)}{(N_2 - N_0)(N_2 - N_1)}$$

$$(r_0, p(r_0)) \quad (r_1, p(r_1)) \quad (r_2, p(r_2))$$

$$p(x) = p(r_0) \cdot \frac{(x-r_1)(x-r_2)}{(r_0-r_1)(r_0-r_2)} +$$

$$+ p(r_1) \cdot \frac{(x-r_0)(x-r_2)}{(r_1-r_0)(r_1-r_2)} +$$

$$+ p(r_2) \cdot \frac{(x-r_0)(x-r_1)}{(r_2-r_0)(r_2-r_1)}$$

$$(v_0, p(v_0)) \quad (v_1, p(v_1)) \quad (v_2, p(v_2))$$

$$p(x) = p(v_0) \cdot \frac{(x - v_1)(x - v_2)}{(v_0 - v_1)(v_0 - v_2)} +$$

$$+ p(v_1) \cdot \frac{(x - v_0)(x - v_2)}{(v_1 - v_0)(v_1 - v_2)} +$$

$$+ p(v_2) \cdot \frac{(x - v_0)(x - v_1)}{(v_2 - v_0)(v_2 - v_1)}$$

$$(v_0, p(v_0)) \quad (v_1, p(v_1)) \quad (v_2, p(v_2))$$

$$p(x) = p(v_0) \cdot \frac{(x-v_1)(x-v_2)}{(v_0-v_1)(v_0-v_2)} +$$

$$+ p(v_1) \cdot \frac{(x-v_0)(x-v_2)}{(v_1-v_0)(v_1-v_2)} +$$

$$+ p(v_2) \cdot \frac{(x-v_0)(x-v_1)}{(v_2-v_0)(v_2-v_1)}$$

$$(N_0, p(N_0)) \quad (N_1, p(N_1)) \quad (N_2, p(N_2))$$

$$P(X) = P(N_0) \cdot \frac{(X - N_1)(X - N_2)}{(N_0 - N_1)(N_0 - N_2)} +$$

$$+ P(N_1) \cdot \frac{(X - N_0)(X - N_2)}{(N_1 - N_0)(N_1 - N_2)}$$

$$+ P(N_2) \cdot \frac{(X - N_0)(X - N_1)}{(N_2 - N_0)(N_2 - N_1)}$$

$$(r_0, p(r_0)) \quad (r_1, p(r_1)) \quad (r_2, p(r_2)) \quad \dots \quad p(x)$$

$$p(x) = p(r_0) \cdot \frac{(x-r_1)(x-r_2)}{(r_0-r_1)(r_0-r_2)} + \dots + (q_0, \dots, q_{n-1})$$

$$+ p(r_1) \cdot \frac{(x-r_0)(x-r_2)}{(r_1-r_0) \cdot (r_1-r_2)} + \dots + (r_n; p(r_{n-1}))$$

$$+ p(r_2) \frac{(x-r_0)(x-r_1)}{(r_2-r_0)(r_2-r_1)}$$

$$(r_0, p(r_0)) \quad (r_1, p(r_1)) \quad (r_2, p(r_2)) \quad \dots \quad p(x)$$

$$p(x) = p(r_0) \cdot \frac{(x-r_1)(x-r_2)}{(r_0-r_1)(r_0-r_2)} + \dots + (q_0, \dots, q_{n-1})$$

$$+ p(r_1) \cdot \frac{(x-r_0)(x-r_2)}{(r_1-r_0) \cdot (r_1-r_2)} + \dots$$

$$+ p(r_2) \frac{(x-r_0)(x-r_1)}{(r_2-r_0)(r_2-r_1)}$$

($r_0, p(r_0)$)
 ($r_{1-1}, p(r_{1-1})$)
 ...
 ($r_n, p(r_n)$)

$$I(n) = L \left\lfloor \frac{n}{2} \right\rfloor + c \cdot n$$

$(r_0, p(r_0))$ $(r_1, p(r_1))$ $(r_2, p(r_2))$

$p(x)$

$$p(x) = p(r_0) \cdot \frac{(x-r_1)(x-r_2)}{(r_0-r_1)(r_0-r_2)} + \dots + (q_0, \dots, q_{n-1})$$

$$+ p(r_1) \cdot \frac{(x-r_0)(x-r_2)}{(r_1-r_0) \cdot (r_1-r_2)} + \dots$$

$$+ p(r_2) \cdot \frac{(x-r_0)(x-r_1)}{(r_2-r_0)(r_2-r_1)}$$

$(r_0, p(r_0))$
 $(r_{i-1}, p(r_{i-1}))$

$$I(n) = L I\left(\frac{n}{2}\right) + c \cdot n$$

$(r_0, p(r_0))$ $(r_1, p(r_1))$ $(r_2, p(r_2))$

$p(x)$

$$\begin{aligned} p(x) &= p(r_0) \cdot \frac{(x-r_1)(x-r_2)}{(r_0-r_1)(r_0-r_2)} + \dots + (q_0, \dots, q_{n-1}) \\ &+ p(r_1) \cdot \frac{(x-r_0)(x-r_2)}{(r_1-r_0) \cdot (r_1-r_2)} + \dots \\ &+ p(r_2) \cdot \frac{(x-r_0)(x-r_1)}{(r_2-r_0)(r_2-r_1)} \end{aligned}$$

$(r_0, p(r_0))$
 $(r_{i-1}, p(r_{i-1}))$

$$I(n) = L I\left(\frac{n}{2}\right) + c \cdot n$$

$(r_0, p(r_0))$ $(r_1, p(r_1))$ $(r_2, p(r_2))$

$p(x)$

$$p(x) = p(r_0) \cdot \frac{(x-r_1)(x-r_2)}{(r_0-r_1)(r_0-r_2)} + \dots + (q_0, \dots, q_{n-1})$$

$$+ p(r_1) \cdot \frac{(x-r_0)(x-r_2)}{(r_1-r_0) \cdot (r_1-r_2)} + \dots$$

$$+ p(r_2) \cdot \frac{(x-r_0)(x-r_1)}{(r_2-r_0)(r_2-r_1)}$$

$(r_0, p(r_0))$
 $(r_{i-1}, p(r_{i-1}))$

$$I(n) = L I\left(\frac{n}{2}\right) + c \cdot n$$

$(r_0, p(r_0))$ $(r_1, p(r_1))$ $(r_2, p(r_2))$

$p(x)$

$$p(x) = p(r_0) \cdot \frac{(x-r_1)(x-r_2)}{(r_0-r_1)(r_0-r_2)} + \dots + (q_0, \dots, q_{n-1})$$

$$+ p(r_1) \cdot \frac{(x-r_0)(x-r_2)}{(r_1-r_0) \cdot (r_1-r_2)} + \dots$$

$$+ p(r_2) \cdot \frac{(x-r_0)(x-r_1)}{(r_2-r_0)(r_2-r_1)}$$

$(r_0, p(r_0))$
 $(r_{i-1}, p(r_{i-1}))$

...
n-1

$$I(n) = L I\left(\frac{n}{2}\right) + c \cdot n$$

$(n_0, p(n_0))$ $(n_1, p(n_1))$ $(n_2, p(n_2))$

$p(x)$

$$p(x) = p(n_0) \cdot \frac{(x - n_1)(x - n_2)}{(n_0 - n_1)(n_0 - n_2)} + \dots + (q_0, \dots, q_{n-1}) \cdot \frac{x^4 - 1}{x^4 - 1}$$

$$+ p(n_1) \cdot \frac{(x - n_0)(x - n_2)}{(n_1 - n_0) \cdot (n_1 - n_2)} +$$

$$+ p(n_2) \cdot \frac{(x - n_0)(x - n_1)}{(n_2 - n_0)(n_2 - n_1)}$$

$$I(n) = L I\left(\frac{n}{2}\right) + c \cdot n$$

$$(n_0, p(n_0)) \quad (n_1, p(n_1)) \quad (n_2, p(n_2))$$

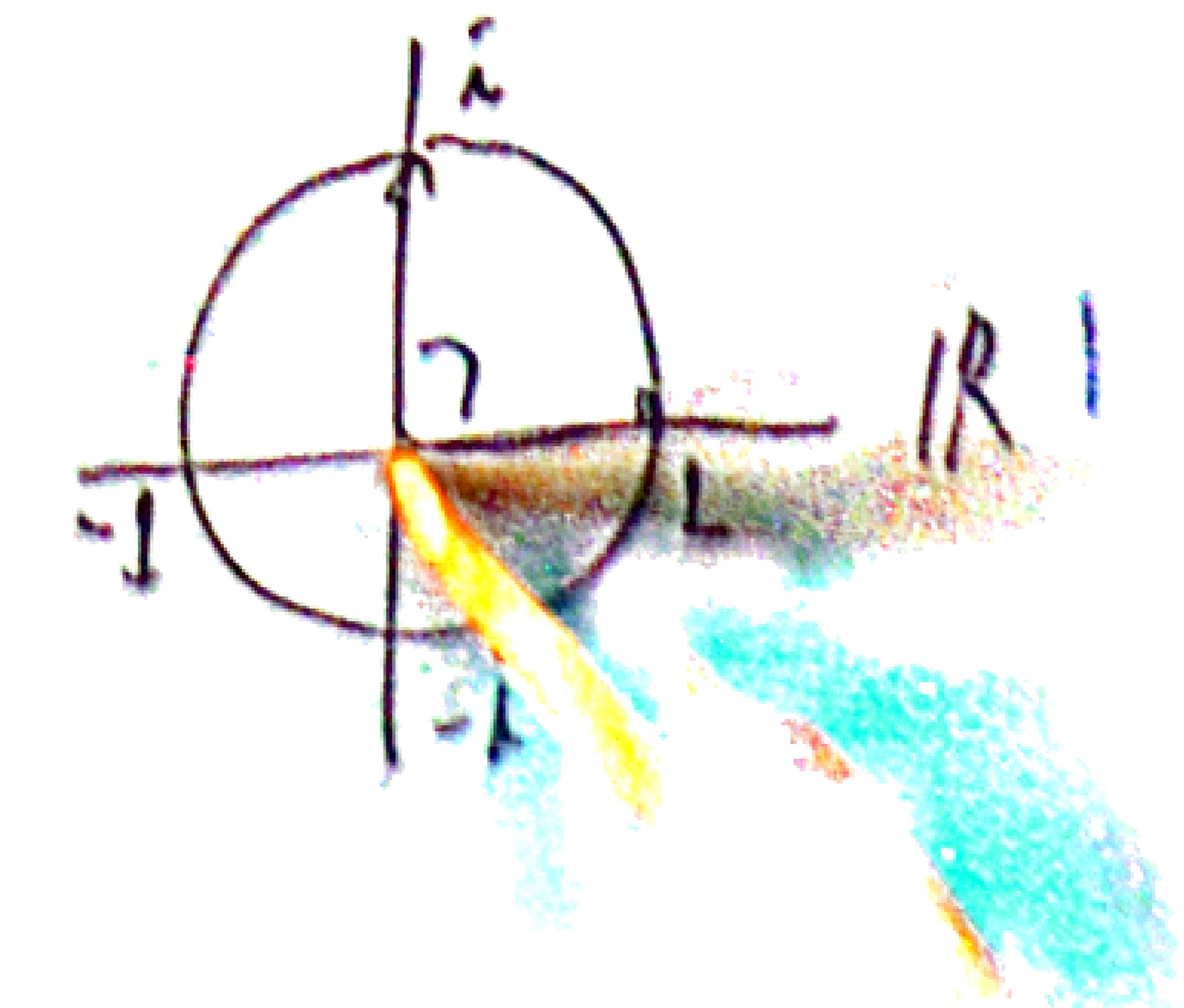
$$p(x)$$

$$p(x) = p(n_0) \cdot \frac{(x-n_1)(x-n_2)}{(n_0-n_1)(n_0-n_2)} + \dots + (q_0, \dots, q_{n-1})$$

$$x^4 - 1$$

$$1, i, -i, -1$$

$$+ p(n_1) \cdot \frac{(x-n_0)(x-n_2)}{(n_1-n_0)(n_1-n_2)} + \dots + p(n_2) \frac{(x-n_0)(x-n_1)}{(n_2-n_0)(n_2-n_1)}$$



$$I(n) = L I\left(\frac{n}{2}\right) + c \cdot n$$

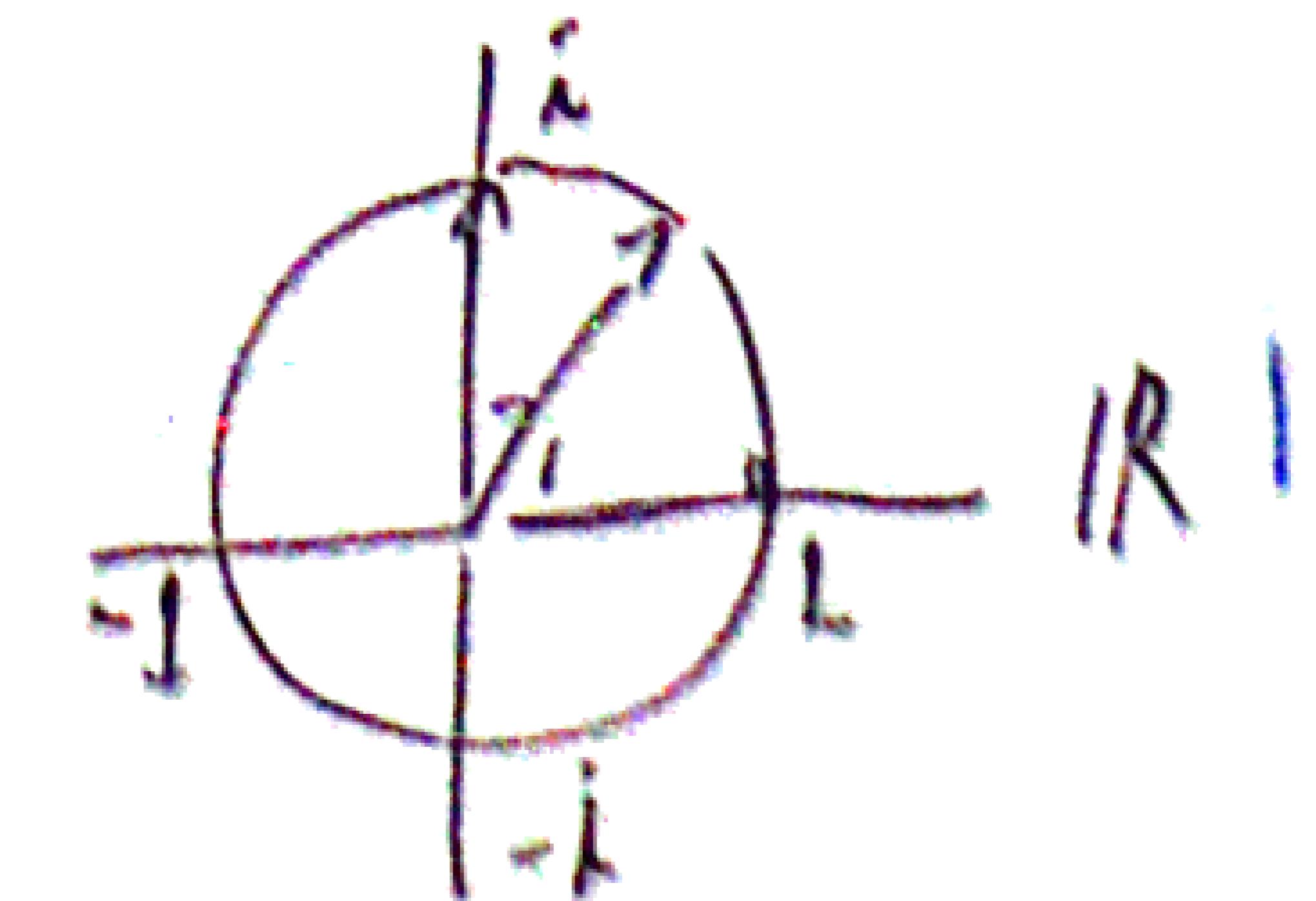
$$(n_0, p(n_0)) \quad (n_1, p(n_1)) \quad (n_2, p(n_2))$$

$$p(x)$$

$$p(x) = p(n_0) \cdot \frac{(x-n_1)(x-n_2)}{(n_0-n_1)(n_0-n_2)} + \dots + (q_0, \dots, q_{n-1})$$

$$x^4 - 1$$

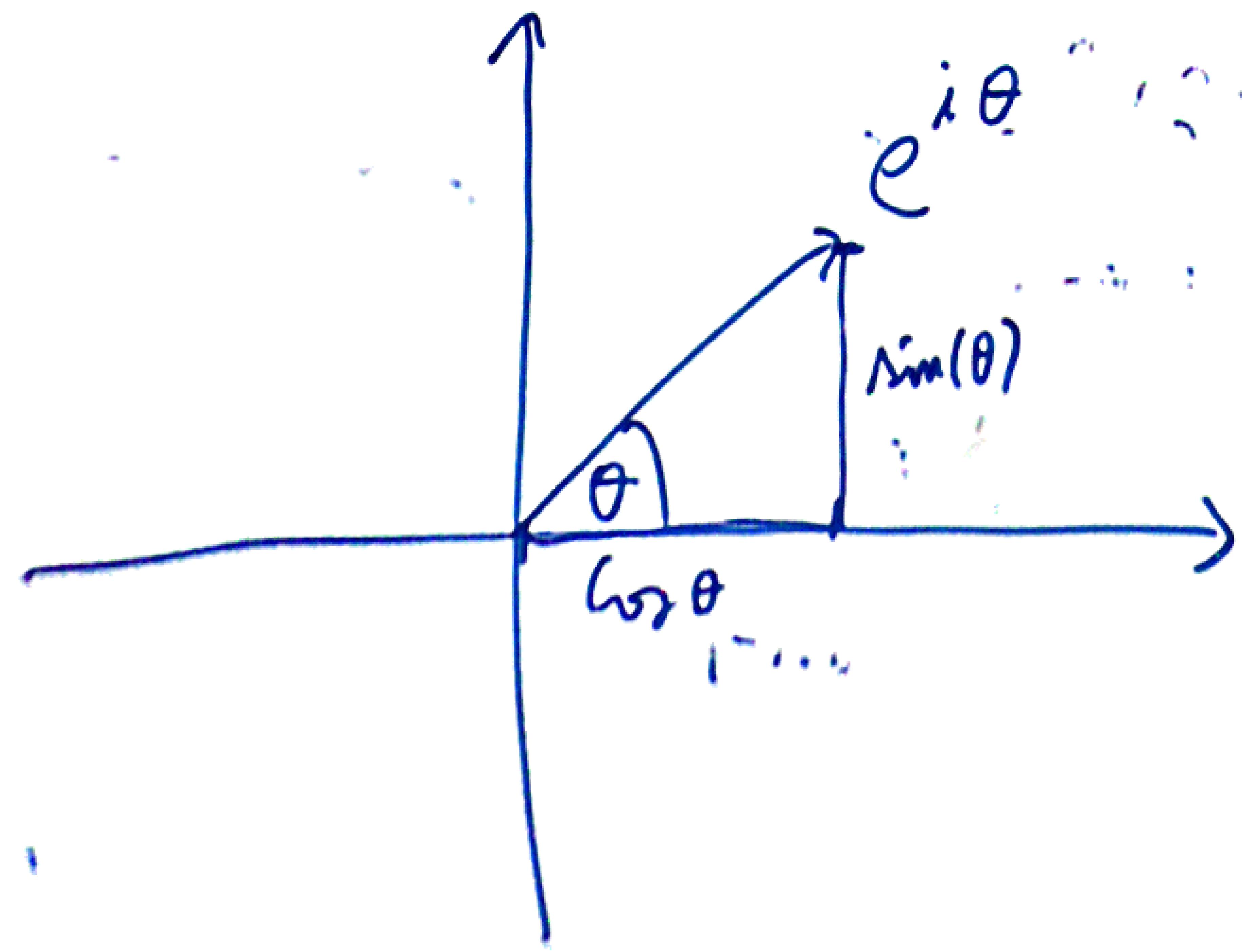
$$1, i, -i, -1$$



$$l(n) = L l\left(\frac{n}{2}\right) + c \cdot n$$

$$(n_0, p(n_0)) \quad (n_1, p(n_1)) \quad (n_2, p(n_2))$$

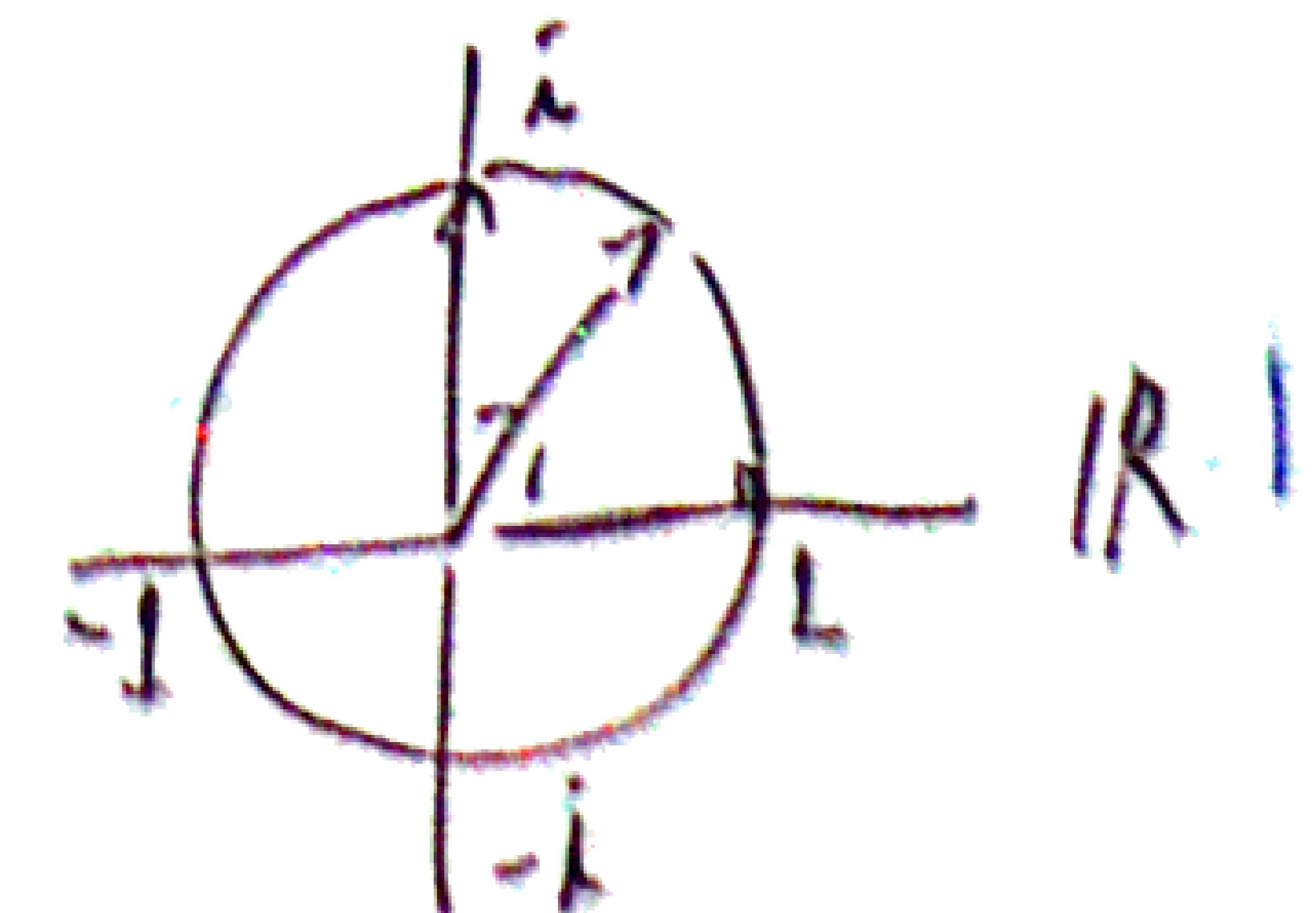
$$p(x)$$



$$(q_0, \dots, q_{n-1})$$

$$x^4 - 1$$

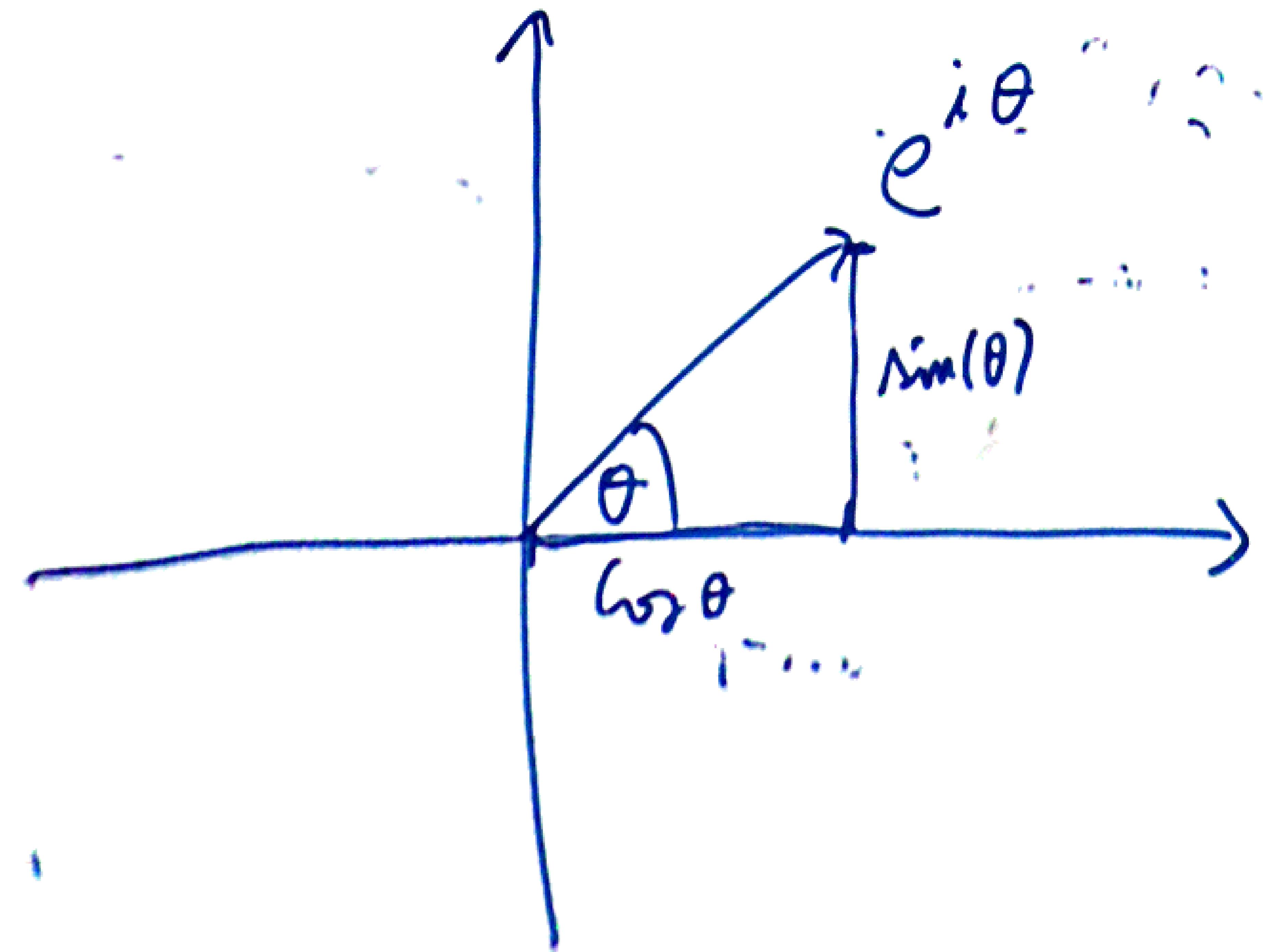
$$1, i, -i, -1$$



$$l(n) = L l\left(\frac{n}{2}\right) + c \cdot n$$

$$(n_0, p(n_0)) \quad (n_1, p(n_1)) \quad (n_2, p(n_2))$$

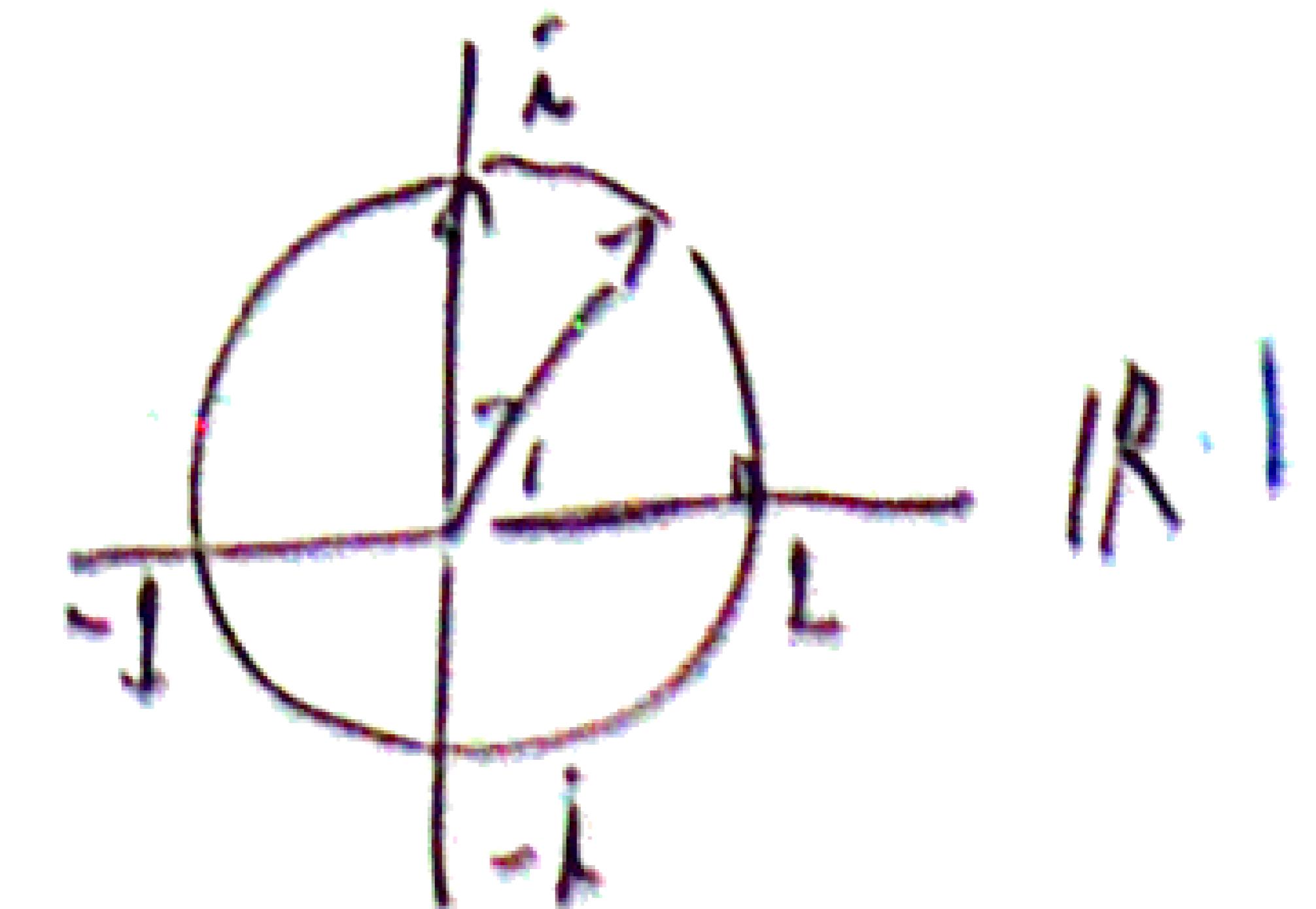
$$p(x)$$



$$(\alpha_0, \dots, \alpha_{n-1})$$

$$x^4 - 1$$

$$1, i, -i, -1$$

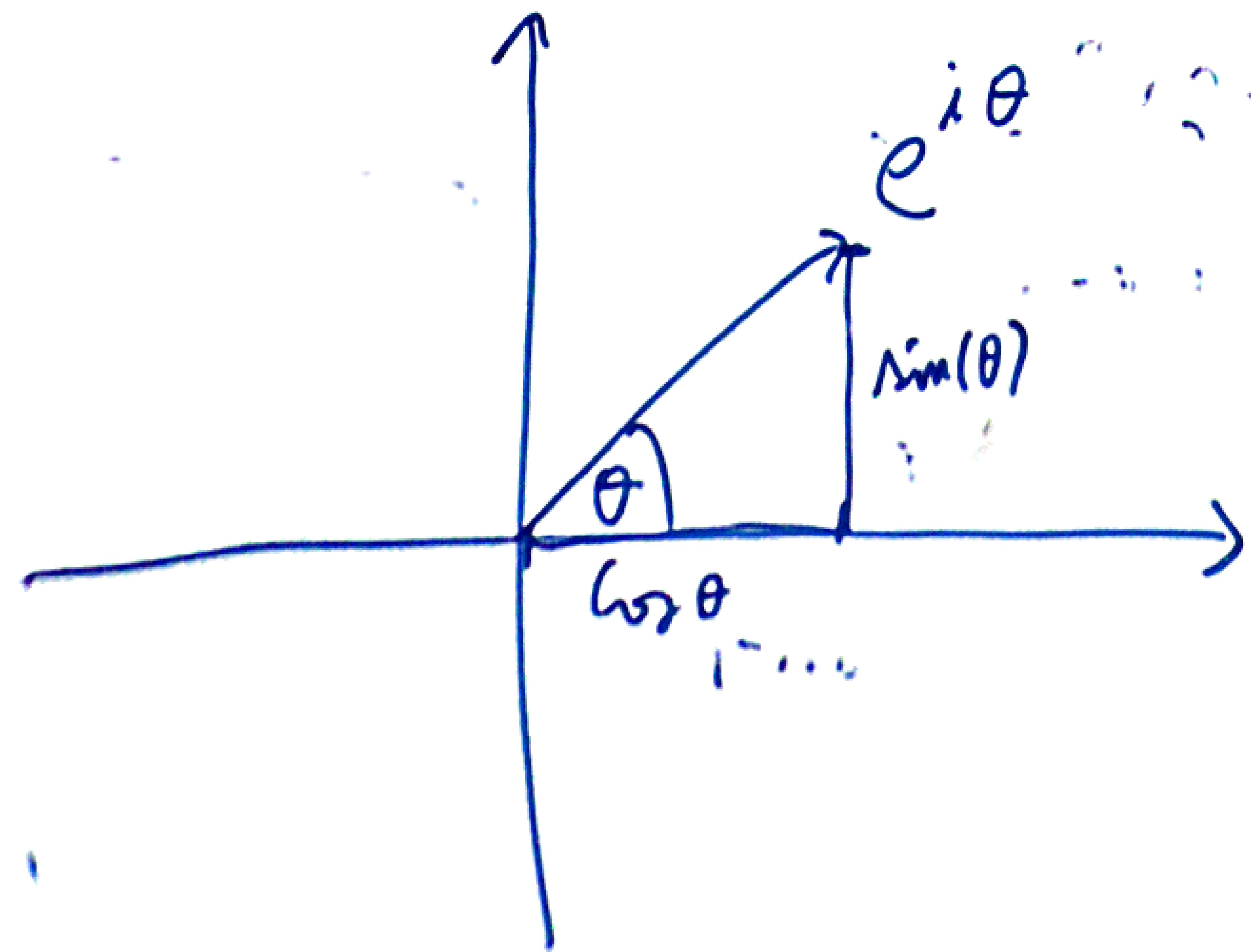


$$|R|$$

$$l(n) = L \left\lfloor \frac{n}{2} \right\rfloor + c \cdot n$$

$$(n_0, p(n_0)) \quad (n_1, p(n_1)) \quad (n_2, p(n_2))$$

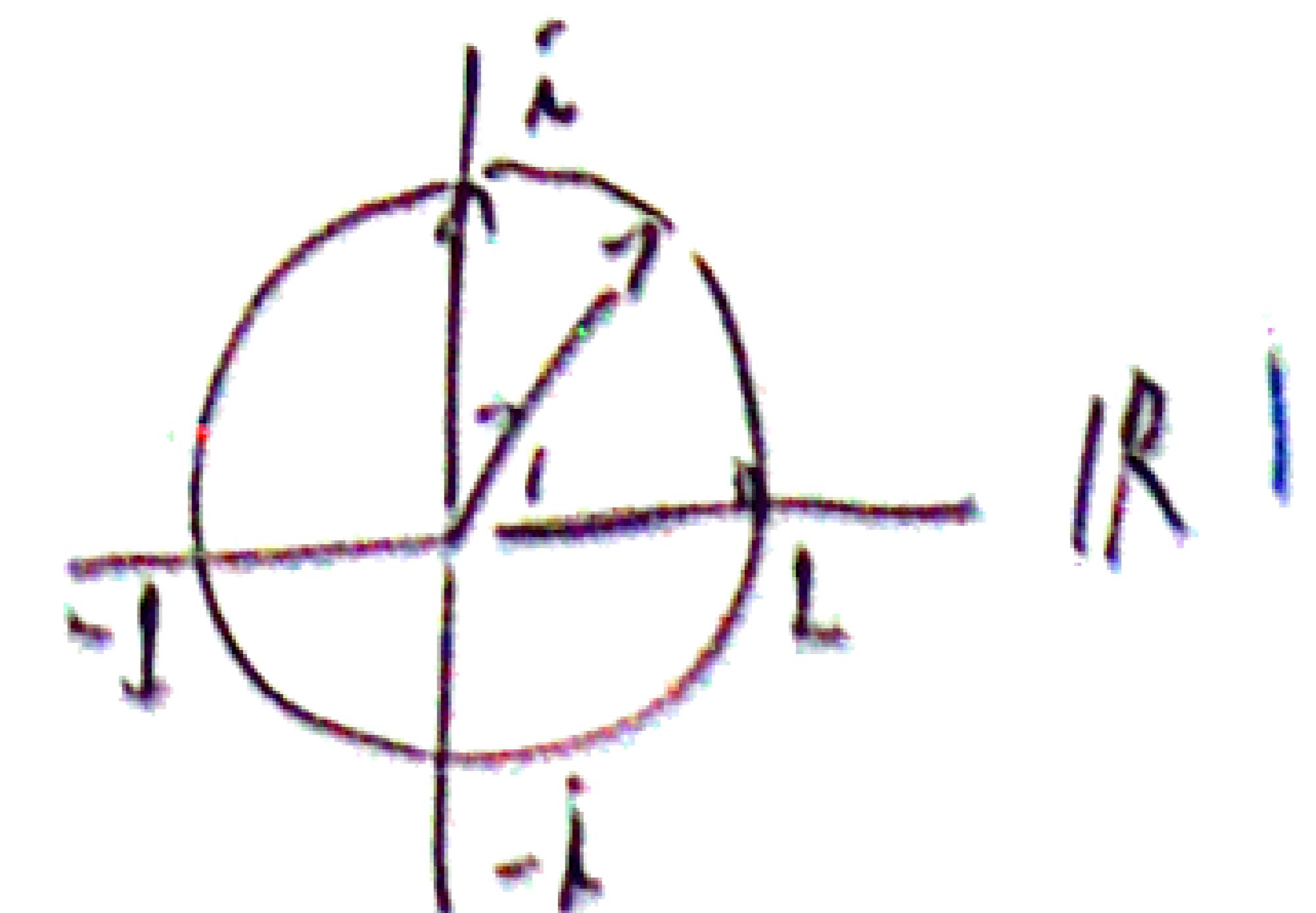
$$p(x)$$



$$(\alpha_0, \dots, \alpha_{n-1})$$

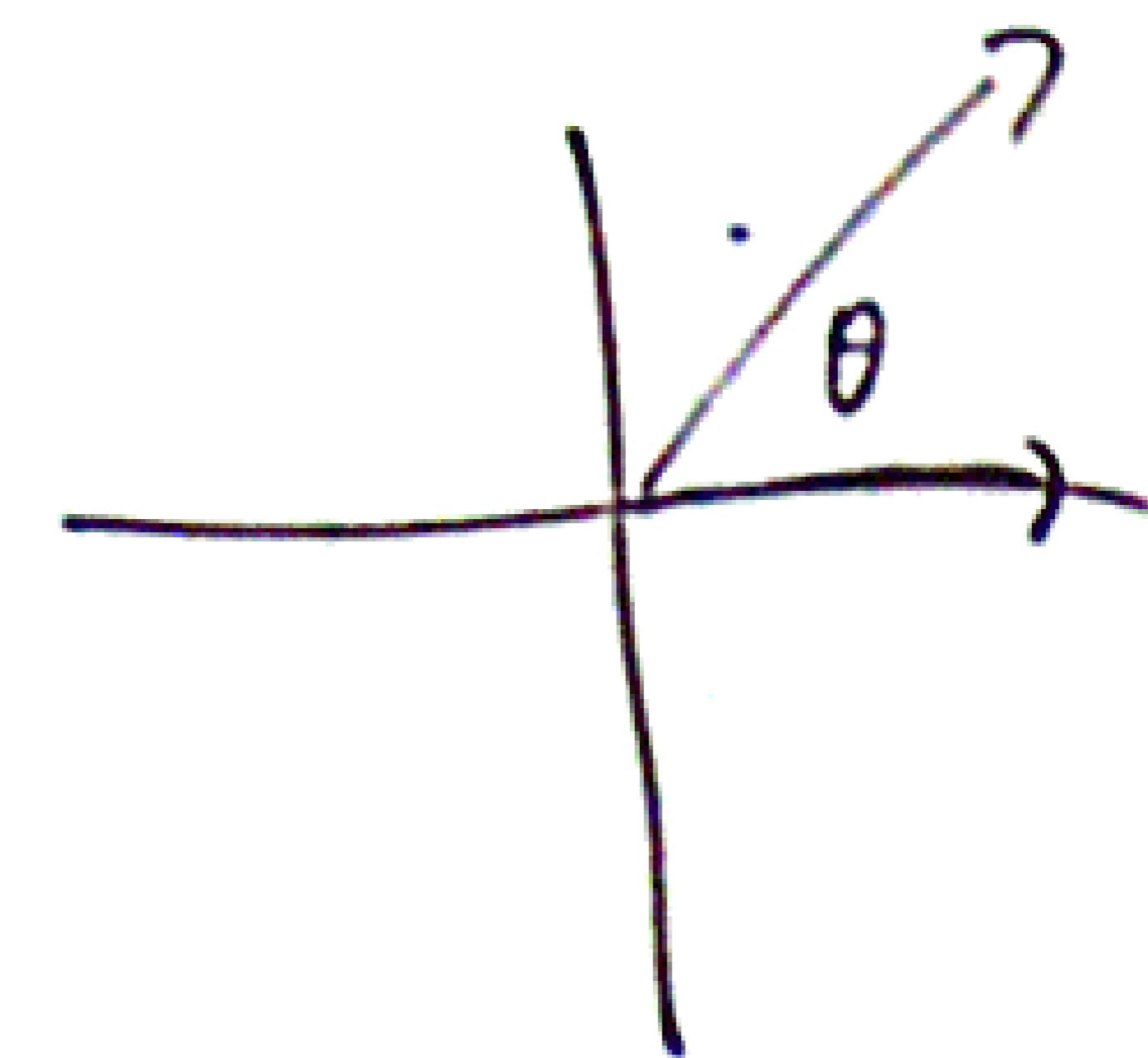
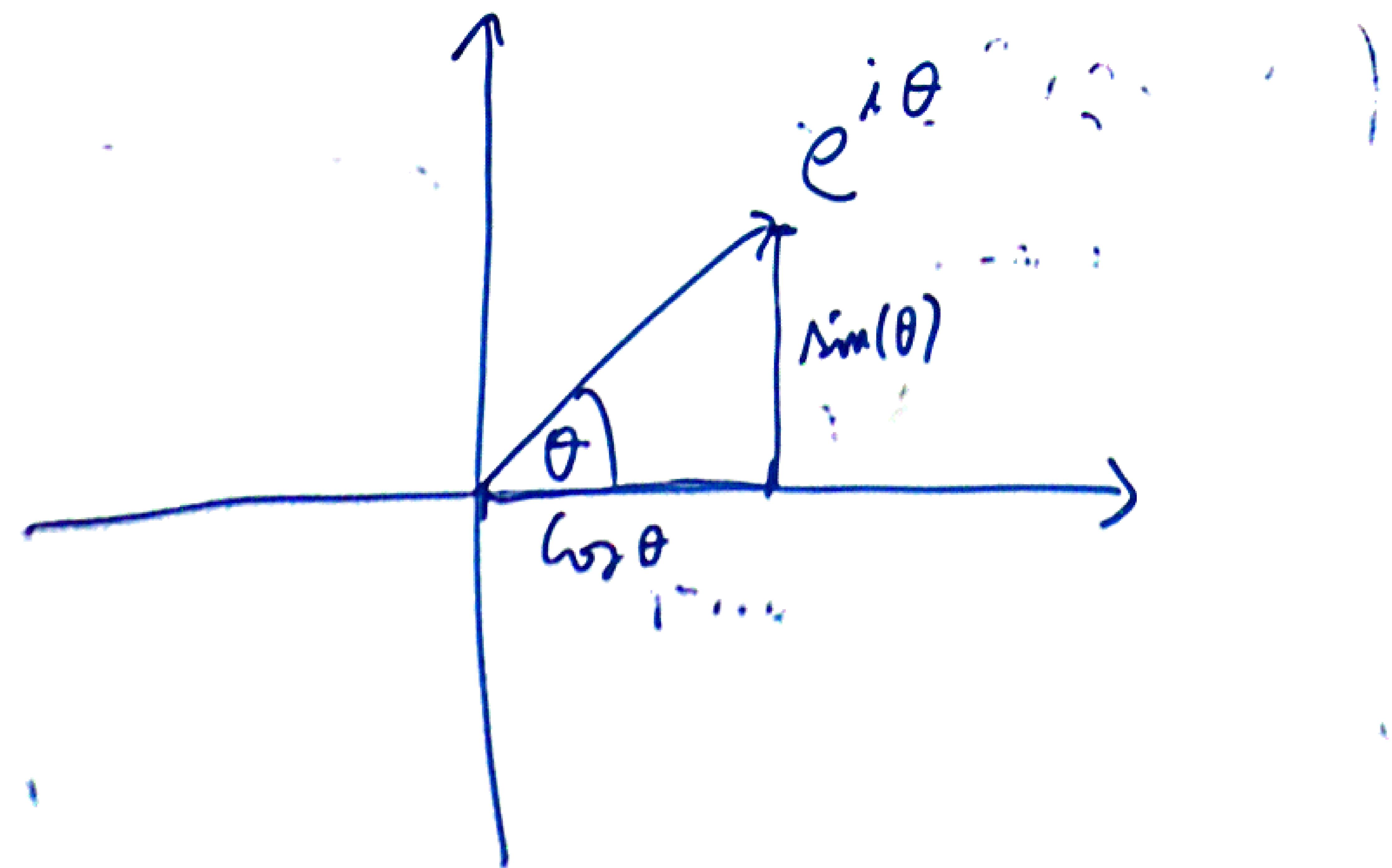
$$x^4 - 1$$

$$1, i, -i, -1$$



$$(r_0, \rho(r_0)) \quad (r_1, \rho(r_1)) \quad (r_2, \rho(r_2))$$

$$X^4 - 1$$

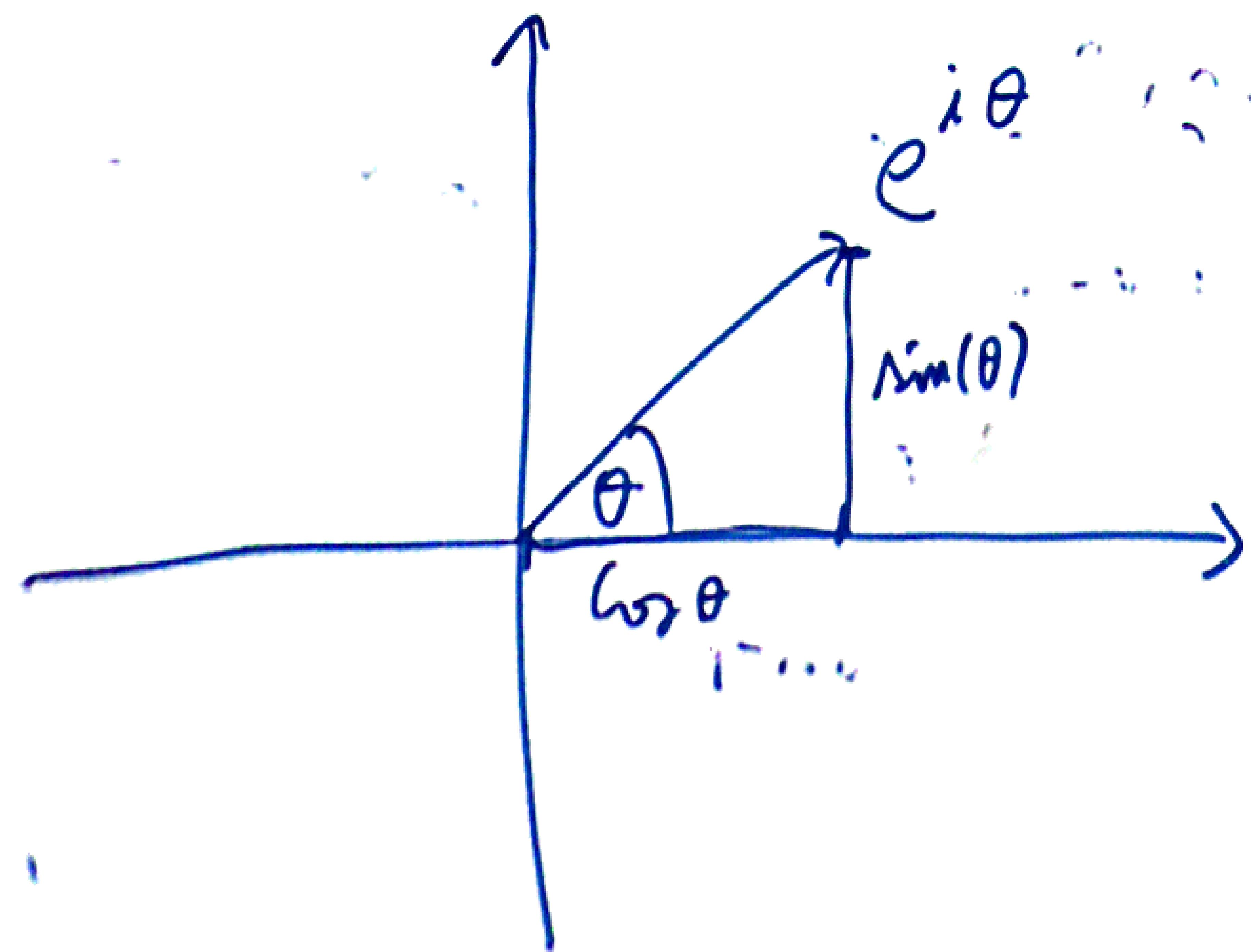


$(\nu_0, \rho(\nu_0))$

$(\nu_1, \rho(\nu_1))$

$(\nu_2, \rho(\nu_2))$

$X^5 - 1$



$$e^{\frac{2\pi i}{5}}$$

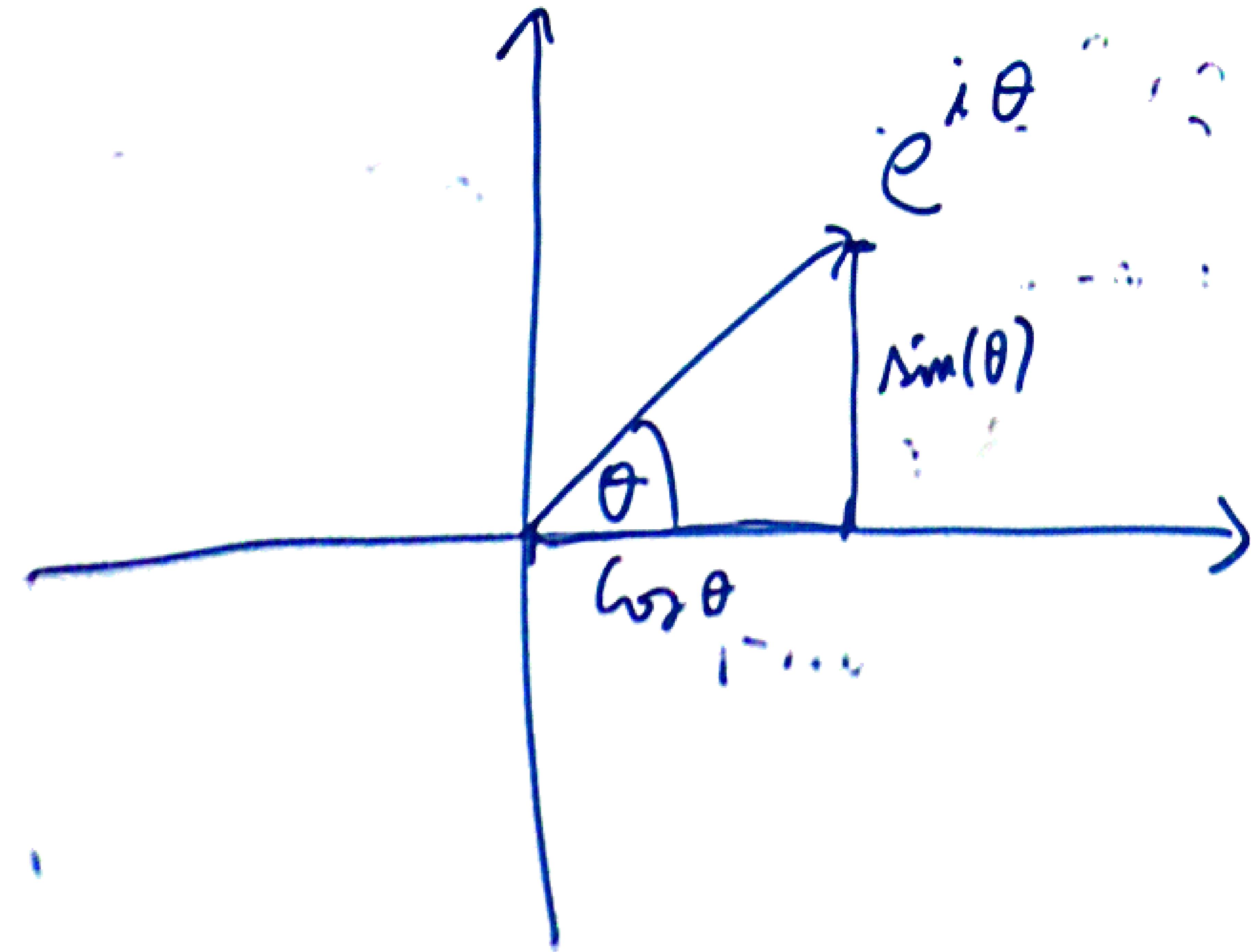


$$(n_0, \rho(n_0))$$

$$(n_1, \rho(n_1))$$

$$(n_2, \rho(n_2))$$

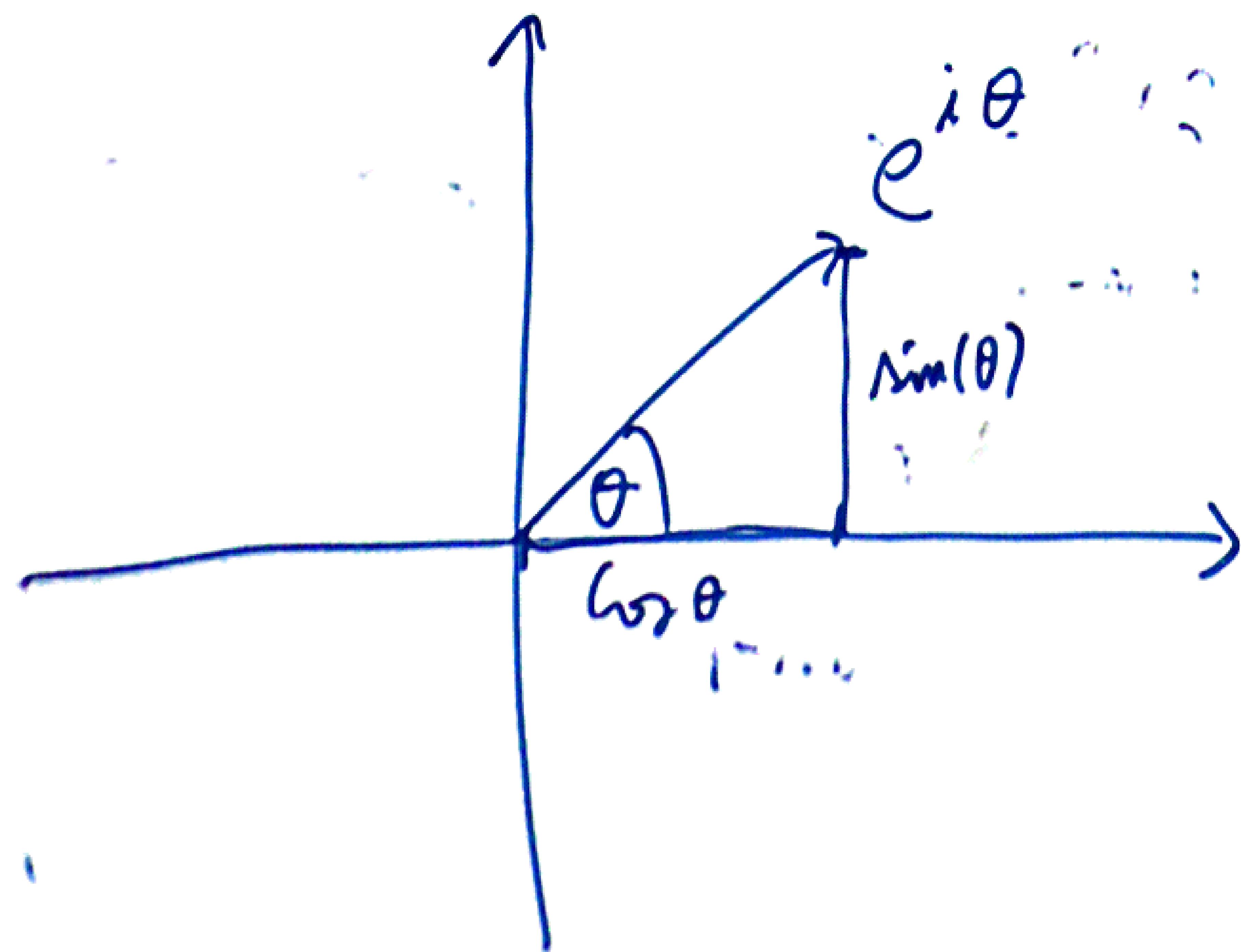
$$X^5 - 1$$



$$\begin{aligned}w_5 &= e^{\frac{2\pi i}{5}} \\&= \left(e^{\frac{2\pi i}{5}}\right)^5 \\&= e^{2\pi i}\end{aligned}$$

$$(n_0, \rho(n_0)) \quad (n_1, \rho(n_1)) \quad (n_2, \rho(n_2))$$

$$X^5 - 1$$



(1)

$$\begin{aligned} w_5 &= e^{\frac{2\pi i}{5}} \\ &= \left(e^{\frac{2\pi i}{5}}\right)^5 = w_5^5 \\ (w_5)^5 &= 1 = (w_5^2)^5 \end{aligned}$$

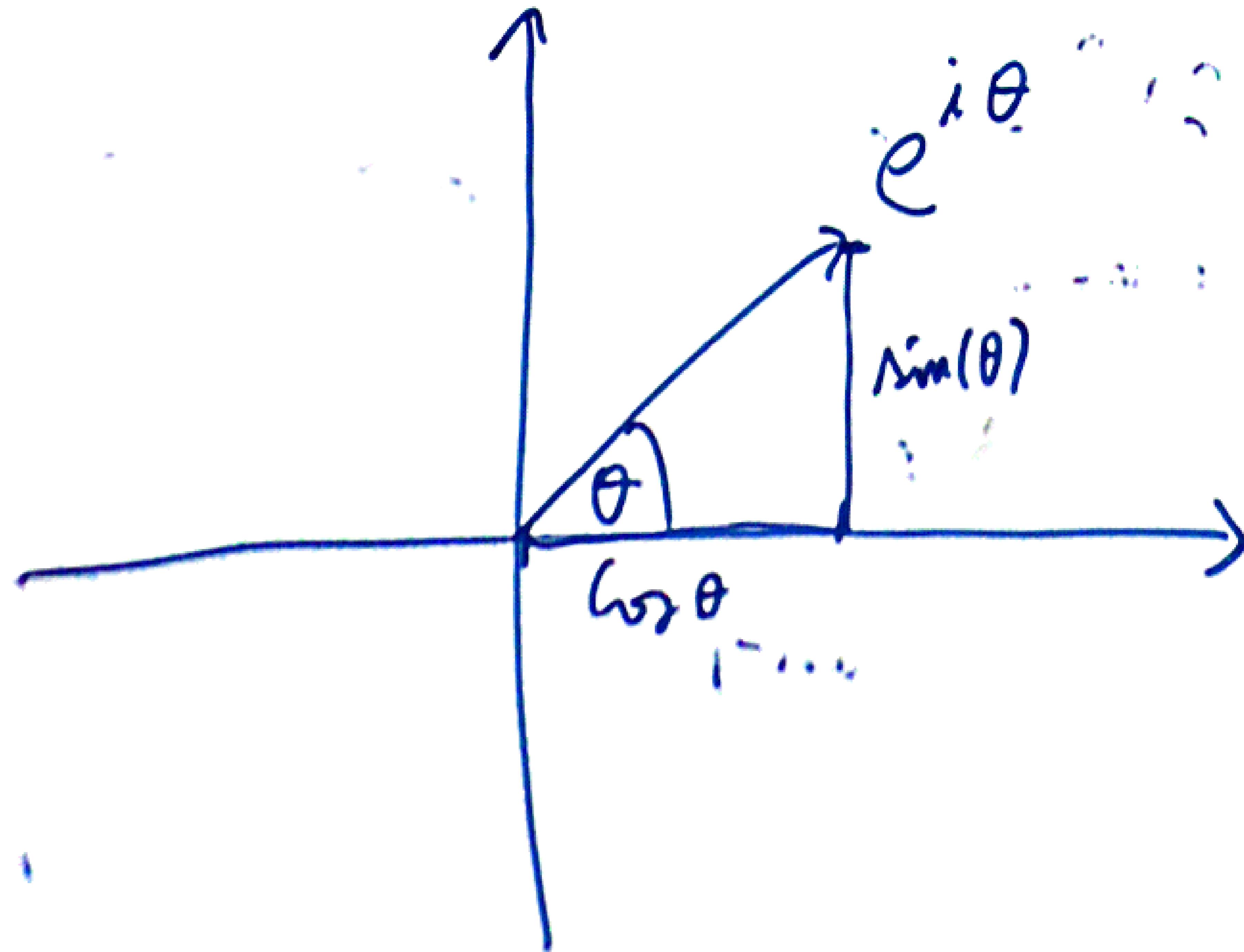
$$e^{\frac{2\pi i}{5} \cdot 2}$$

$$(n_0, \rho(n_0))$$

$$(n_1, \rho(n_1))$$

$$(n_2, \rho(n_2))$$

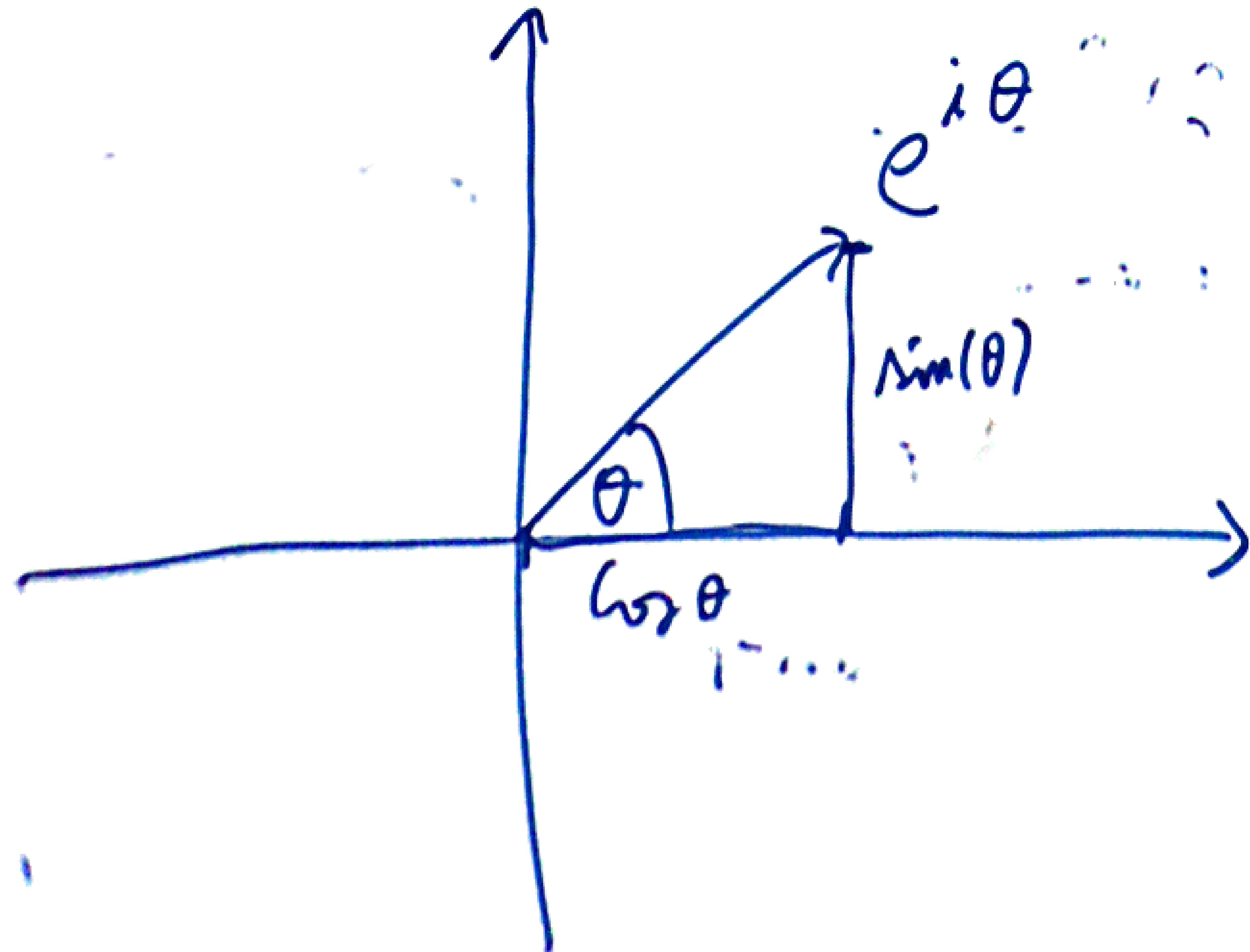
$$X^5 - 1$$



$$\begin{aligned}w_5 &= e^{\frac{2\pi i}{5}} = w_s^2 \\(w_s)^5 &= 1 \Rightarrow (w_s^2)^5 \\&\Rightarrow e^{\frac{2\pi i}{5} \cdot 2}\end{aligned}$$

$$(n_0, \rho(n_0)) \quad (n_1, \rho(n_1)) \quad (n_2, \rho(n_2))$$

$$X^5 - 1$$



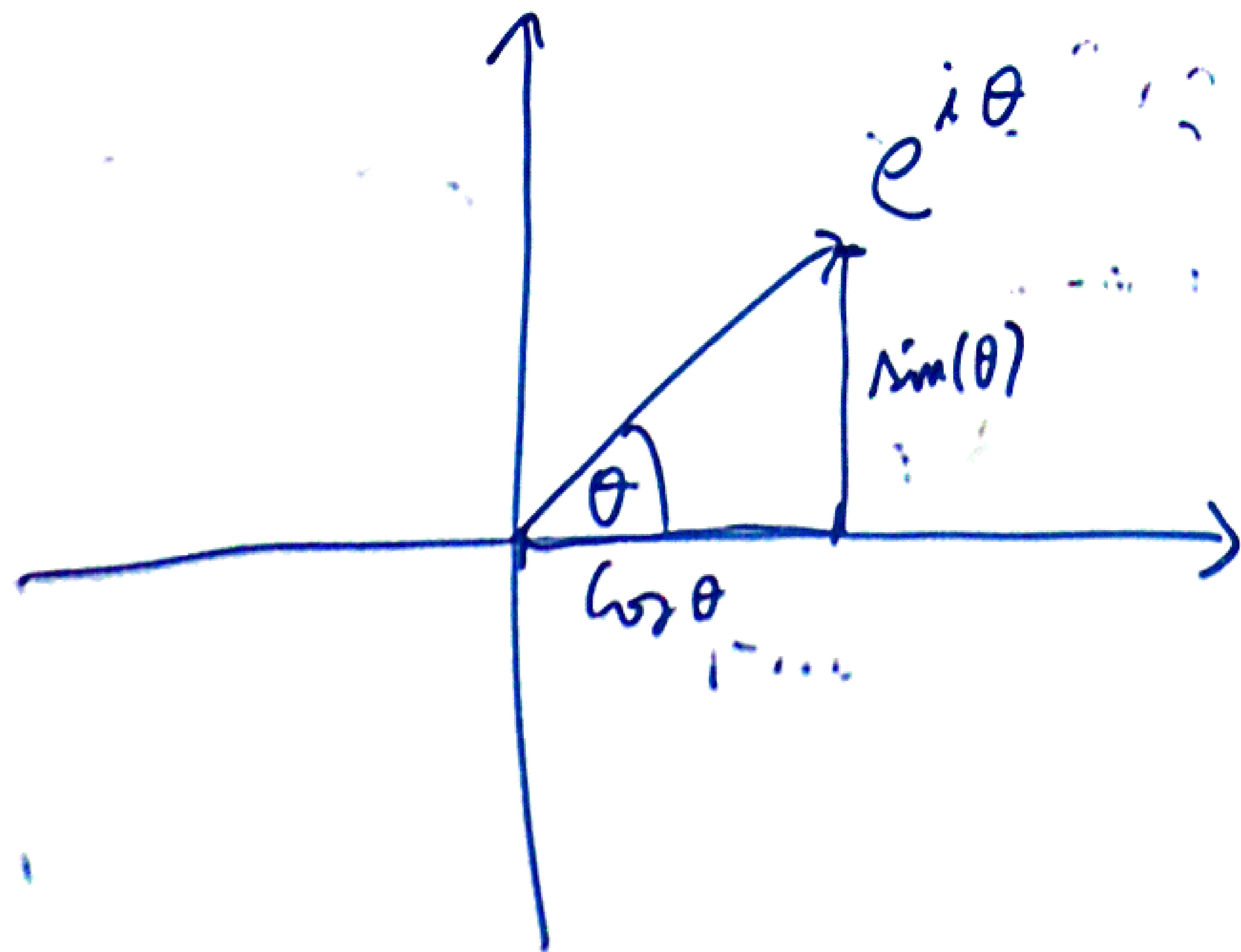
$$\begin{aligned} w_5 &= e^{\frac{2\pi i}{5}} \\ &= \left(e^{\frac{2\pi i}{5}}\right)^5 = w_5^5 \\ (w_5)^5 &= 1 \cdot (w_5^2)^5 \\ &= e^{\frac{2\pi i}{5} \cdot 2} \end{aligned}$$

$$(n_0, \rho(n_0))$$

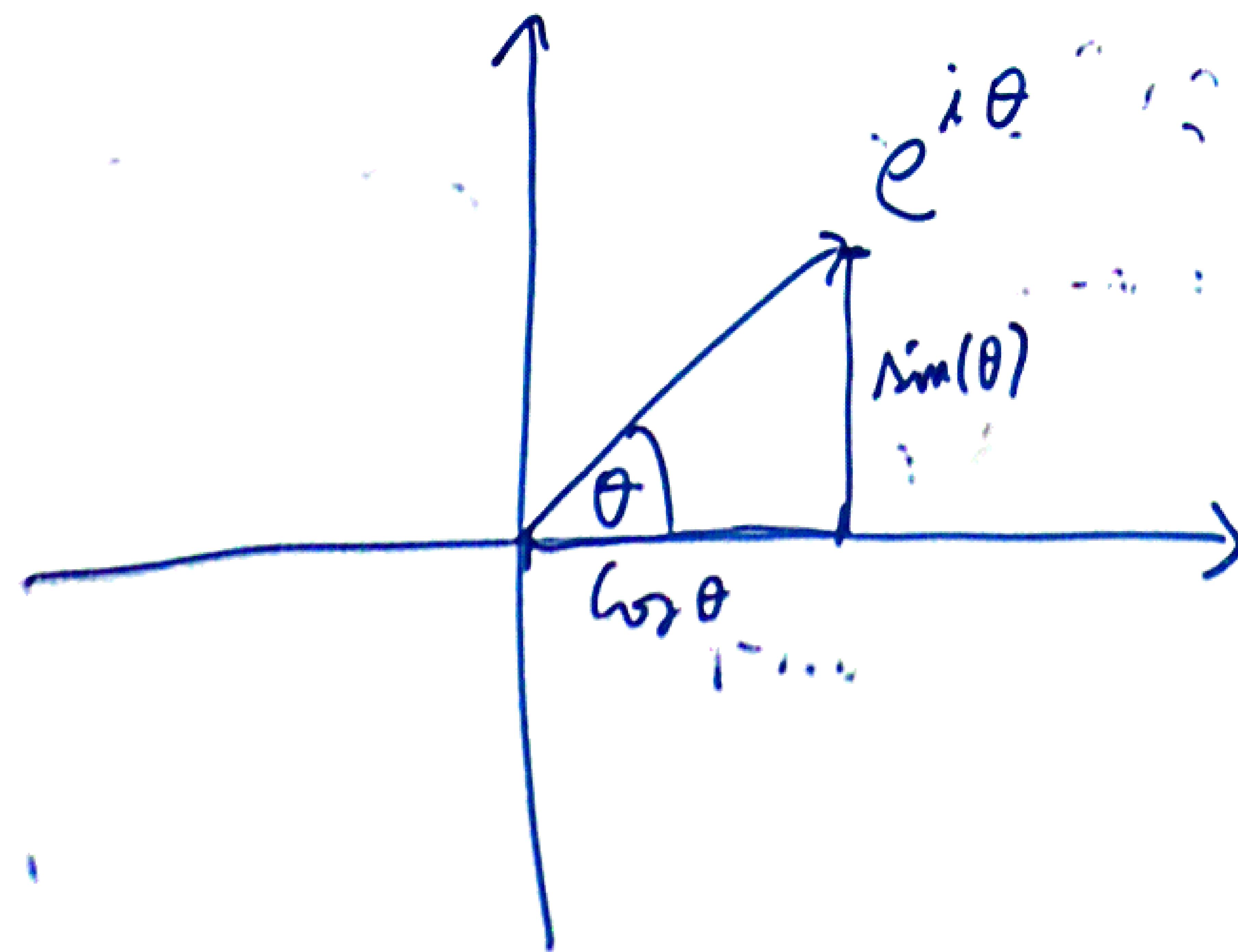
$$(n_1, \rho(n_1))$$

$$(n_2, \rho(n_2))$$

$$X^5 - 1$$



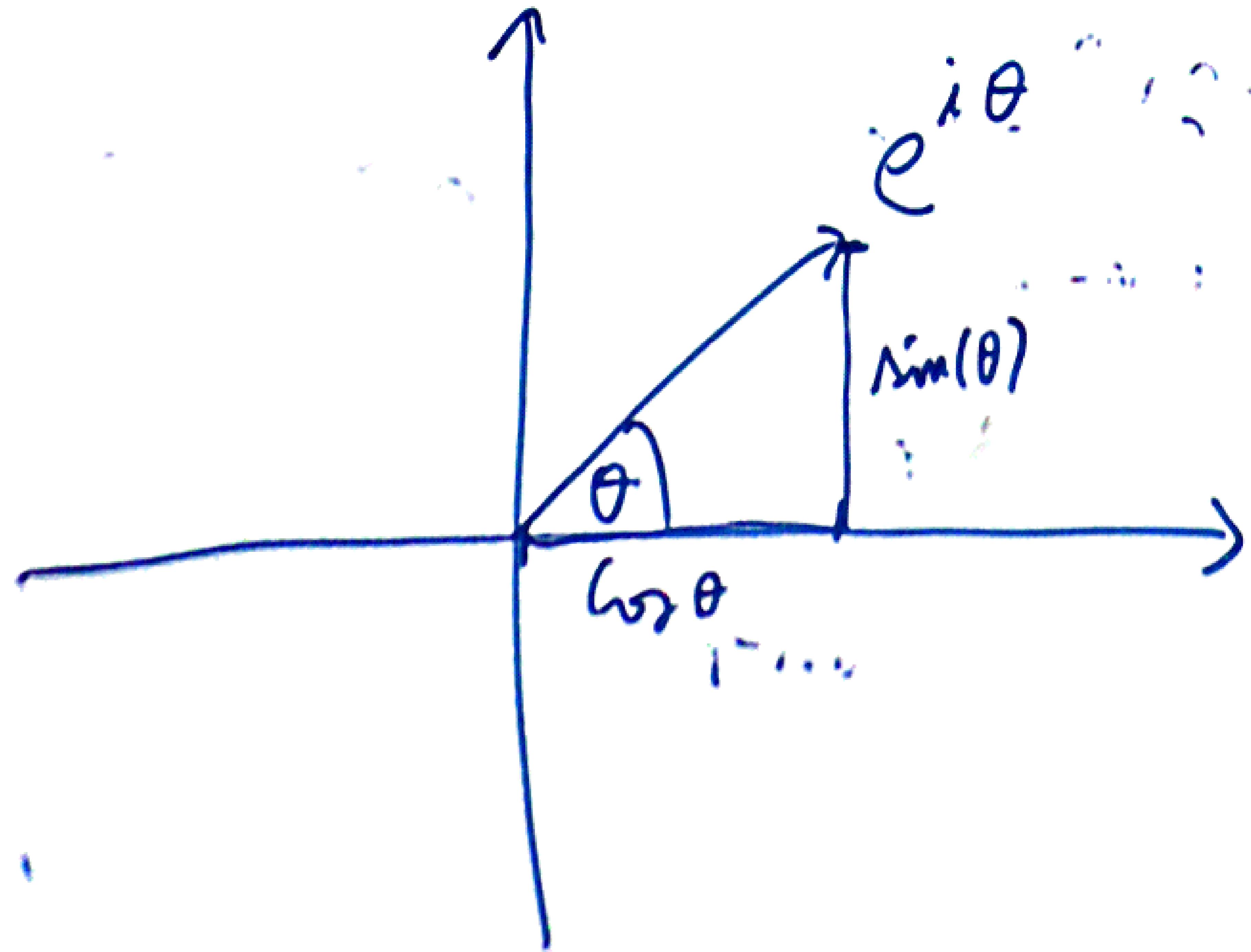
$$\begin{aligned}w_5 &= e^{\frac{2\pi i}{5}} = w_s^2 \\(w_s)^5 &= 1 \Rightarrow (w_s^2)^5 \\&\Rightarrow e^{\frac{2\pi i}{5} \cdot 2}\end{aligned}$$

$(r_0, \rho(r_0))$ $(r_1, \rho(r_1))$ $(r_2, \rho(r_2))$ $X^5 - 1$ 

$$w_5 = e^{\frac{2\pi i}{5}}$$
$$(e^{\frac{2\pi i}{5}})^5 = 1 \quad (e^{\frac{2\pi i}{5}})^2$$
$$e^{\frac{2\pi i}{5} \cdot 2}$$

$$(n_0, p(n_0)) \quad (n_1, p(n_1)) \quad (n_2, p(n_2))$$

$$X^5 - 1$$



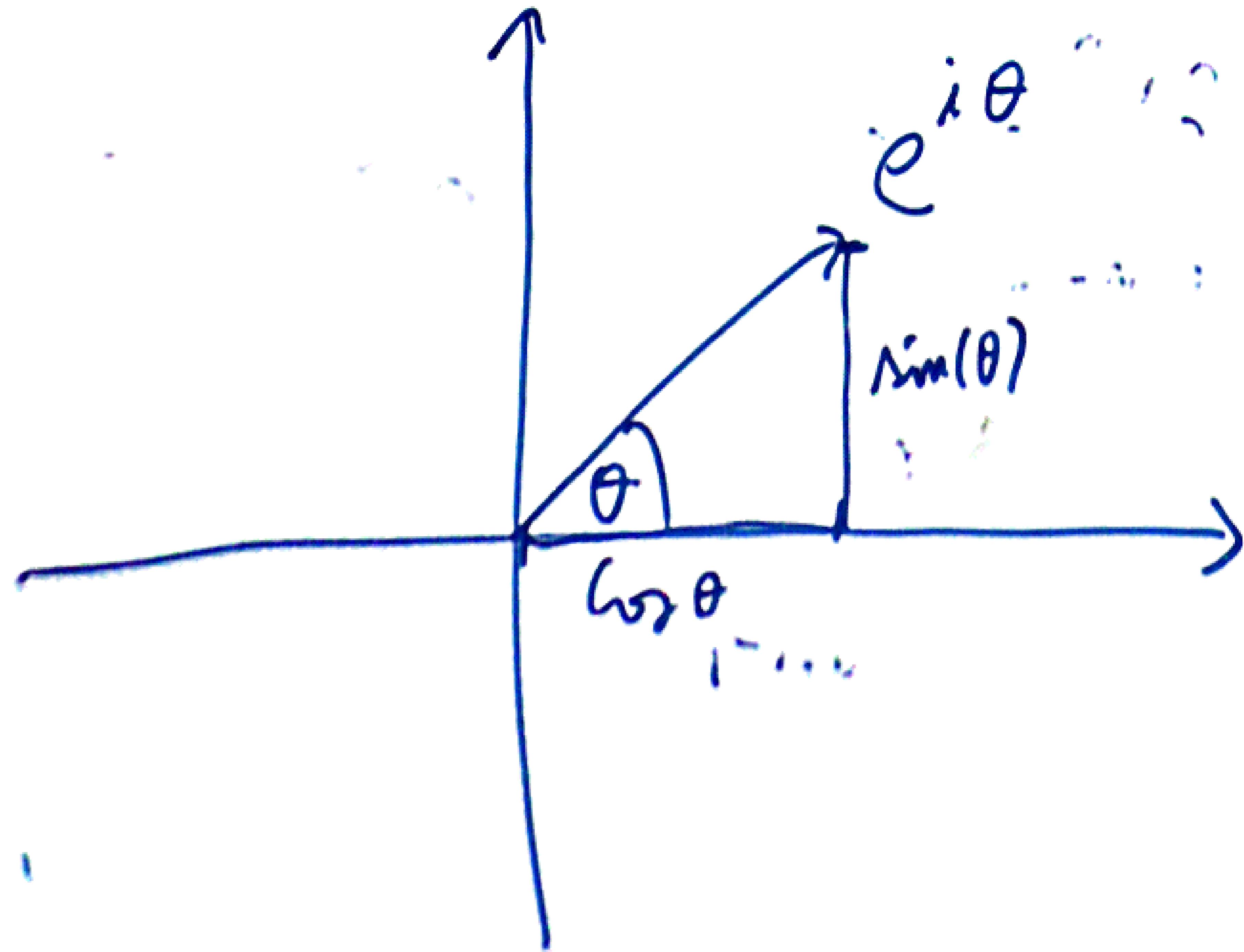
$$w_5 = e^{\frac{2\pi i}{5}}$$

$$\left(e^{\frac{2\pi i}{5}}\right)^5 = w_5^5 = 1$$

$$e^{\frac{2\pi i}{5} \cdot 2}$$

$(n_0, \rho(n_0))$ $(n_1, \rho(n_1))$ $(n_2, \rho(n_2))$

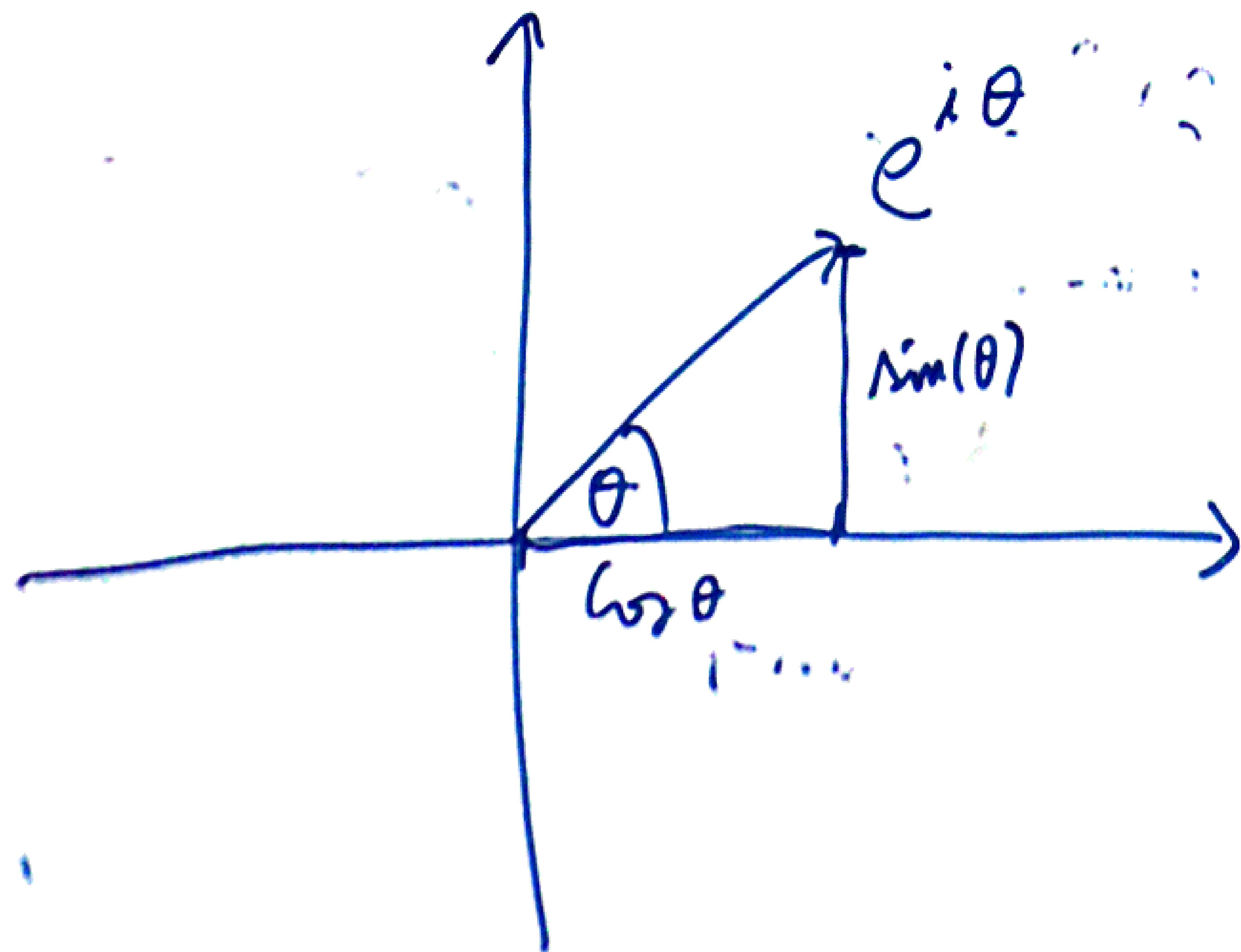
$$X^5 - 1$$



$$\begin{aligned} w_5 &= e^{\frac{2\pi i}{5}} \\ &\left(e^{\frac{2\pi i}{5}} \right)^5 = w_5^5 = w_5^2 \\ \left(w_5 \right)^5 &= 1 \cdot \left(w_5^2 \right)^5 \\ &e^{\frac{2\pi i}{5} \cdot 2} \end{aligned}$$

$(r_0, \rho(r_0))$ $(r_1, \rho(r_1))$ $(r_2, \rho(r_2))$

$$X^5 - 1$$



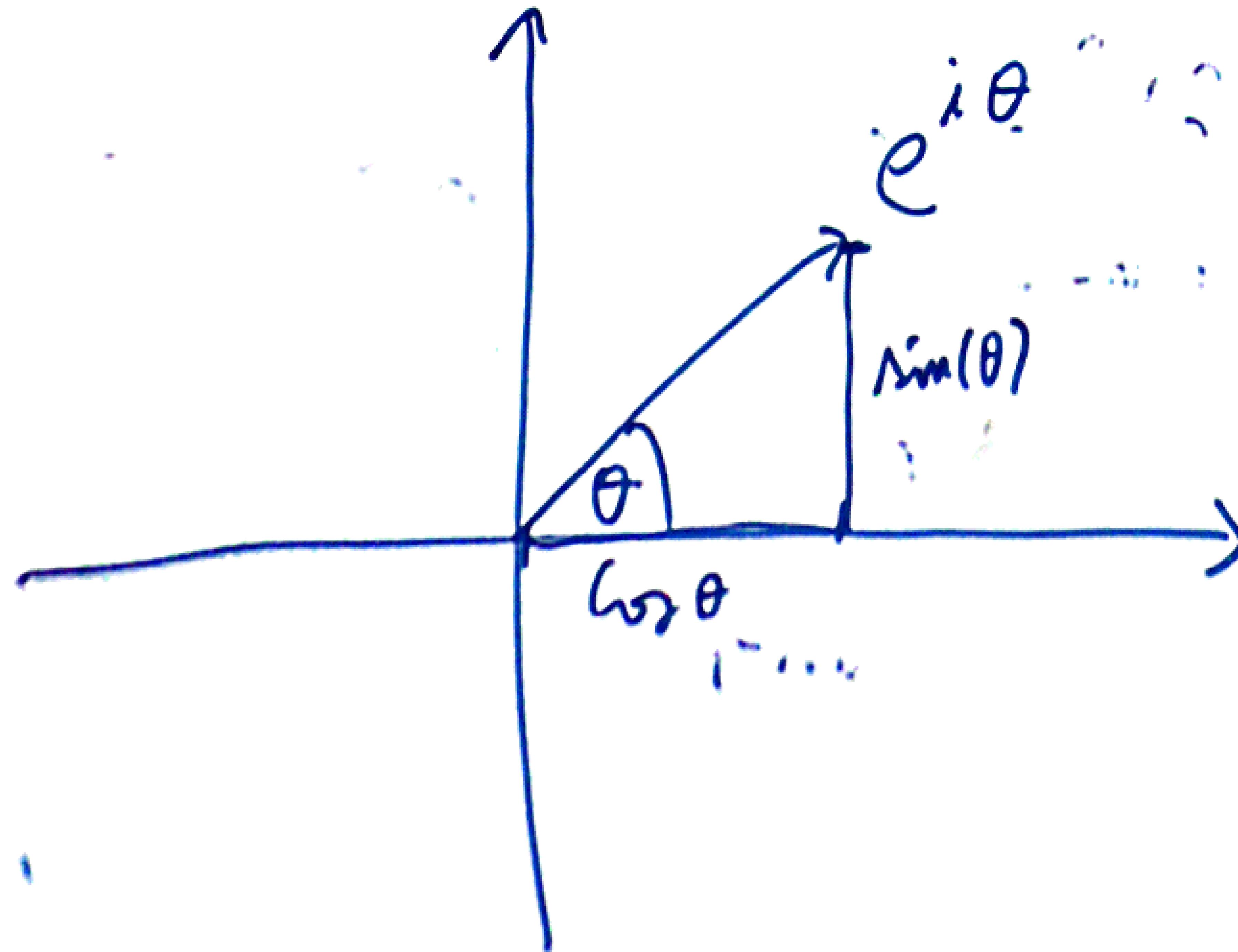
$$\begin{aligned} w_5 &= e^{\frac{2\pi i}{5}} \\ &= (e^{\frac{2\pi i}{5}})^5 = w_5^5 \\ (w_5)^5 &= 1 \cdot (w_5')^5 \\ &= e^{\frac{2\pi i}{5} \cdot 2} \end{aligned}$$

$$(r_0, \rho(r_0))$$

$$(r_1, \rho(r_1))$$

$$(r_2, \rho(r_2))$$

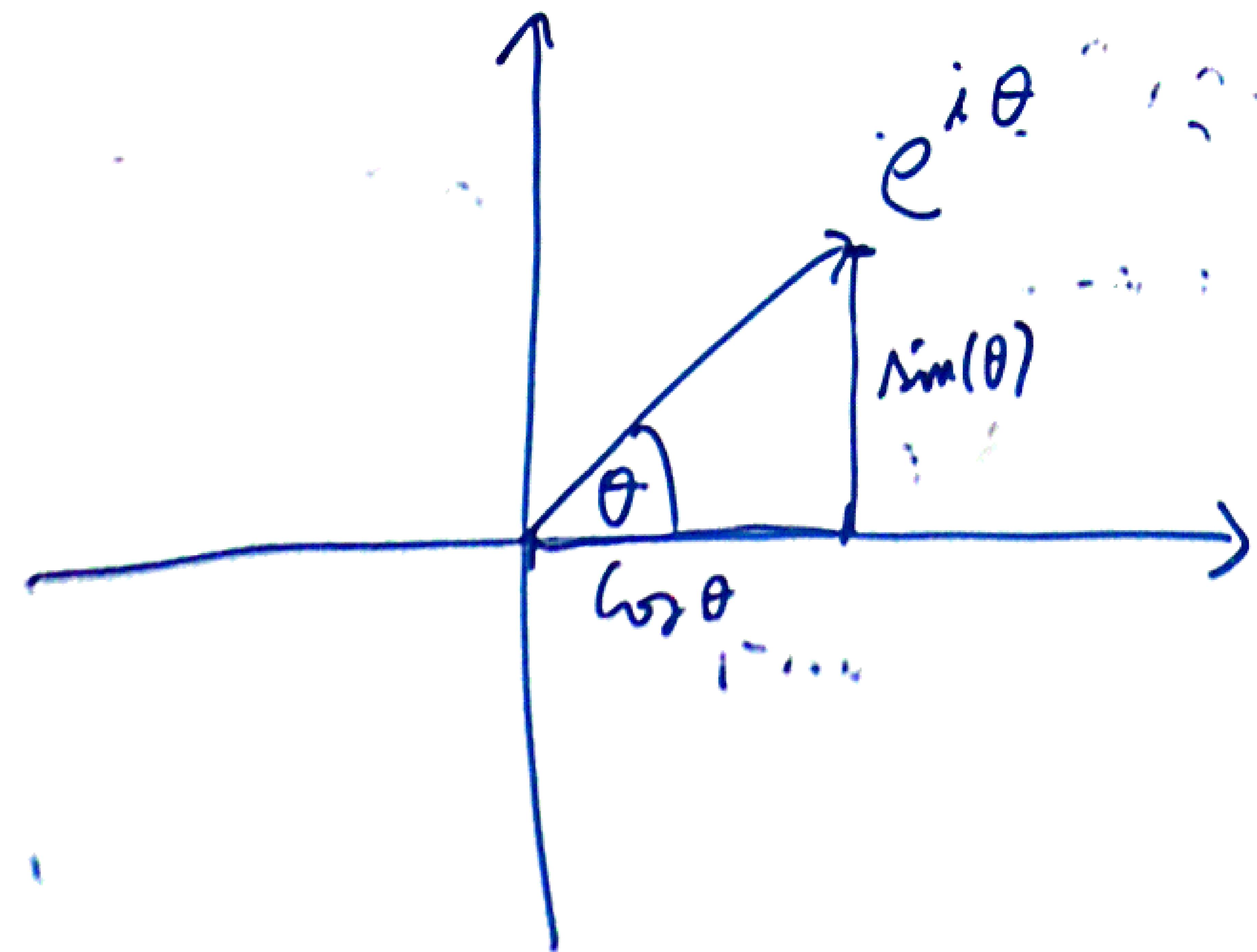
$$x^5 - 1$$



$$\omega_5 = e^{\frac{2\pi i}{5}}$$
$$(\omega_5)^5 = 1 \quad (\omega_5^2)^5$$
$$e^{\frac{2\pi i}{5} \cdot 2}$$

$$(n_0, \rho(n_0)) \quad (n_1, \rho(n_1)) \quad (n_2, \rho(n_2))$$

$$X^5 - 1$$



(1)

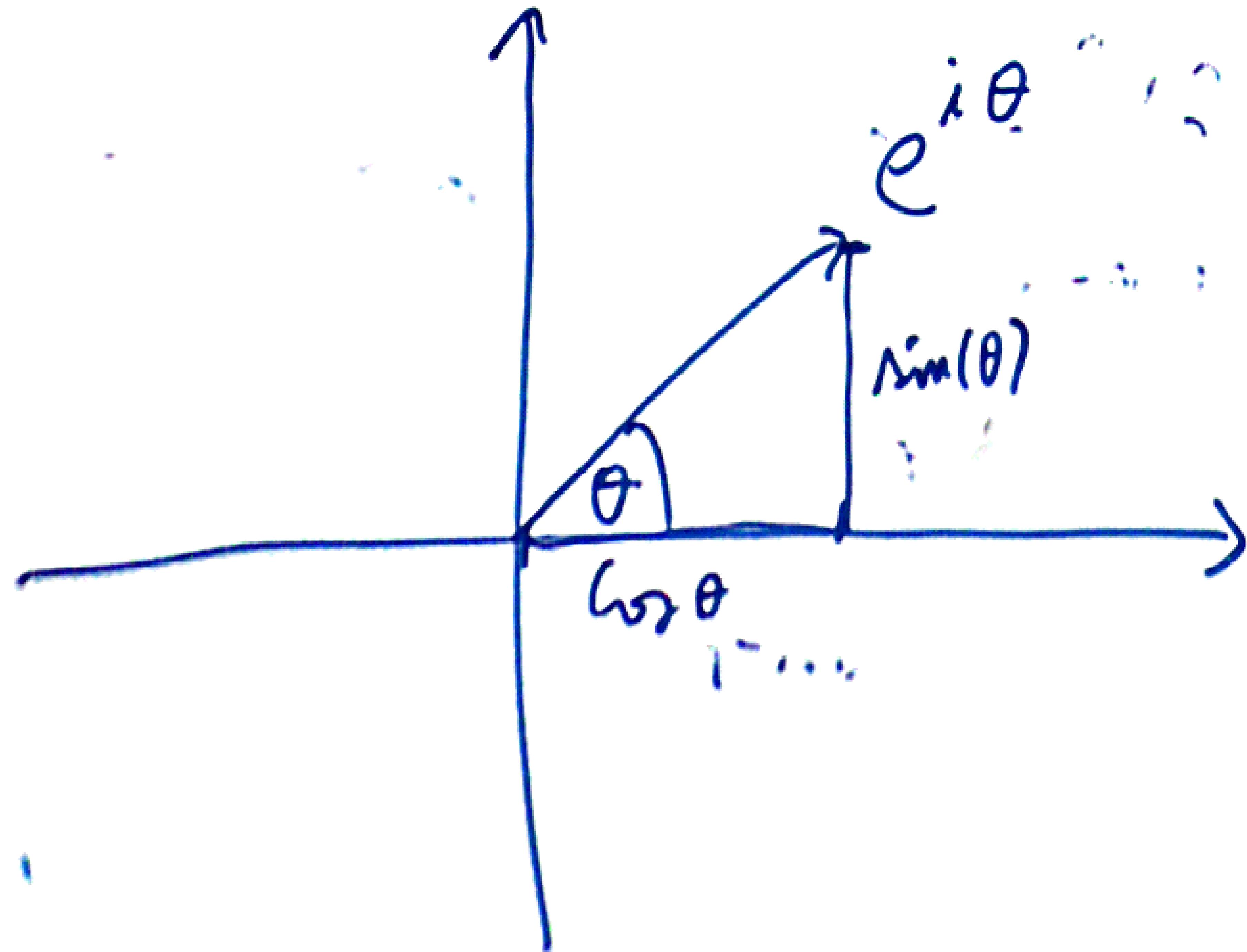
$$\begin{aligned} w_5 &= e^{\frac{2\pi i}{5}} = w_s^2 \\ (w_s)^5 &= 1 \Rightarrow (w_s^2)^5 \\ &\Rightarrow e^{\frac{2\pi i}{5} \cdot 2} \end{aligned}$$

$(n_0, \rho(n_0))$

$(n_1, \rho(n_1))$

$(n_2, \rho(n_2))$

$X^5 - 1$



$$w_5 = e^{\frac{2\pi i}{5}}$$
$$(e^{\frac{2\pi i}{5}})^5 = w_5^2$$
$$(w_5)^5 = 1 \quad (w_5^2)^5$$

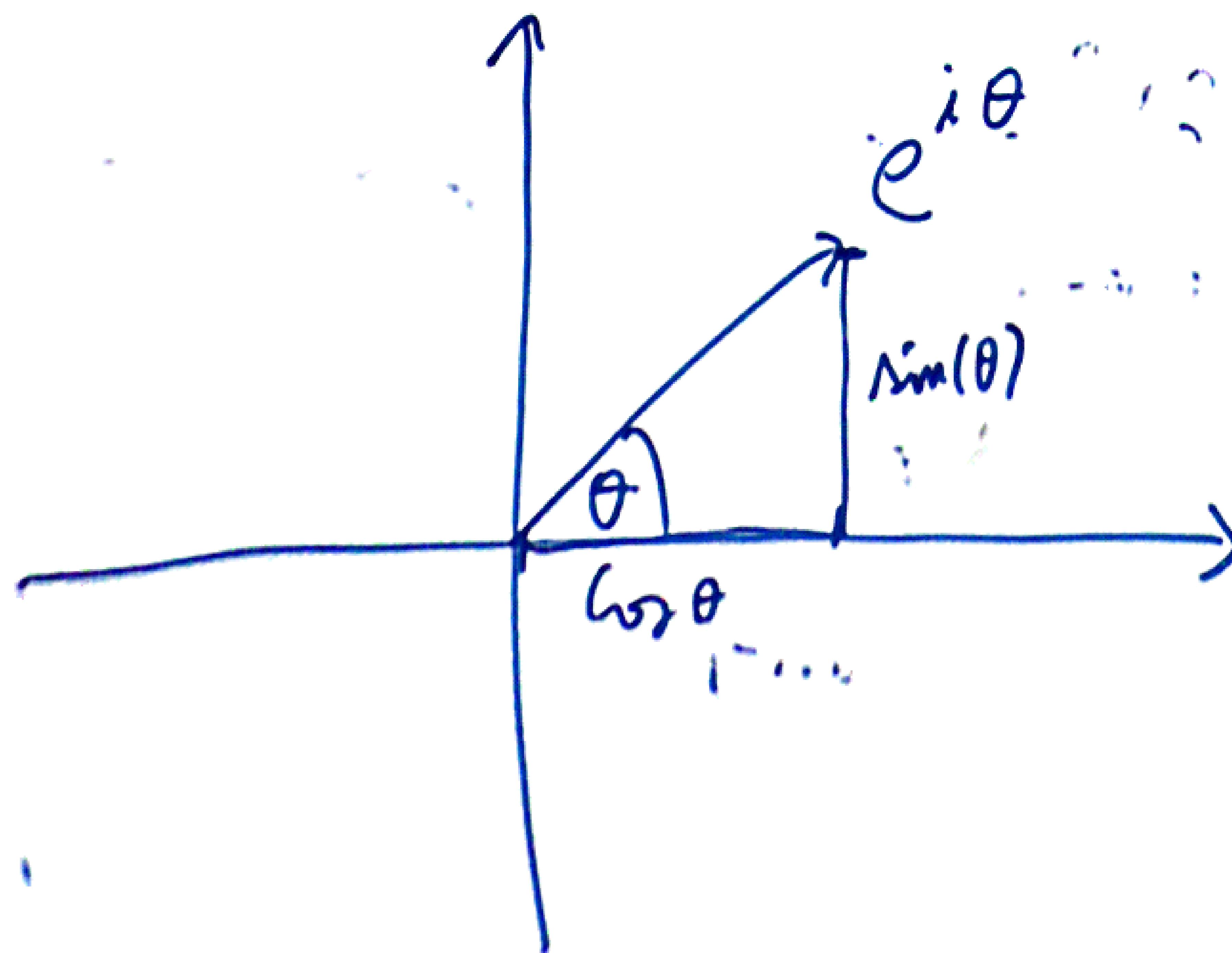
$$e^{\frac{2\pi i}{5}}$$

$$(n_0, \rho(n_0))$$

$$(n_1, \rho(n_1))$$

$$(n_2, \rho(n_2))$$

$$X^5 - 1$$



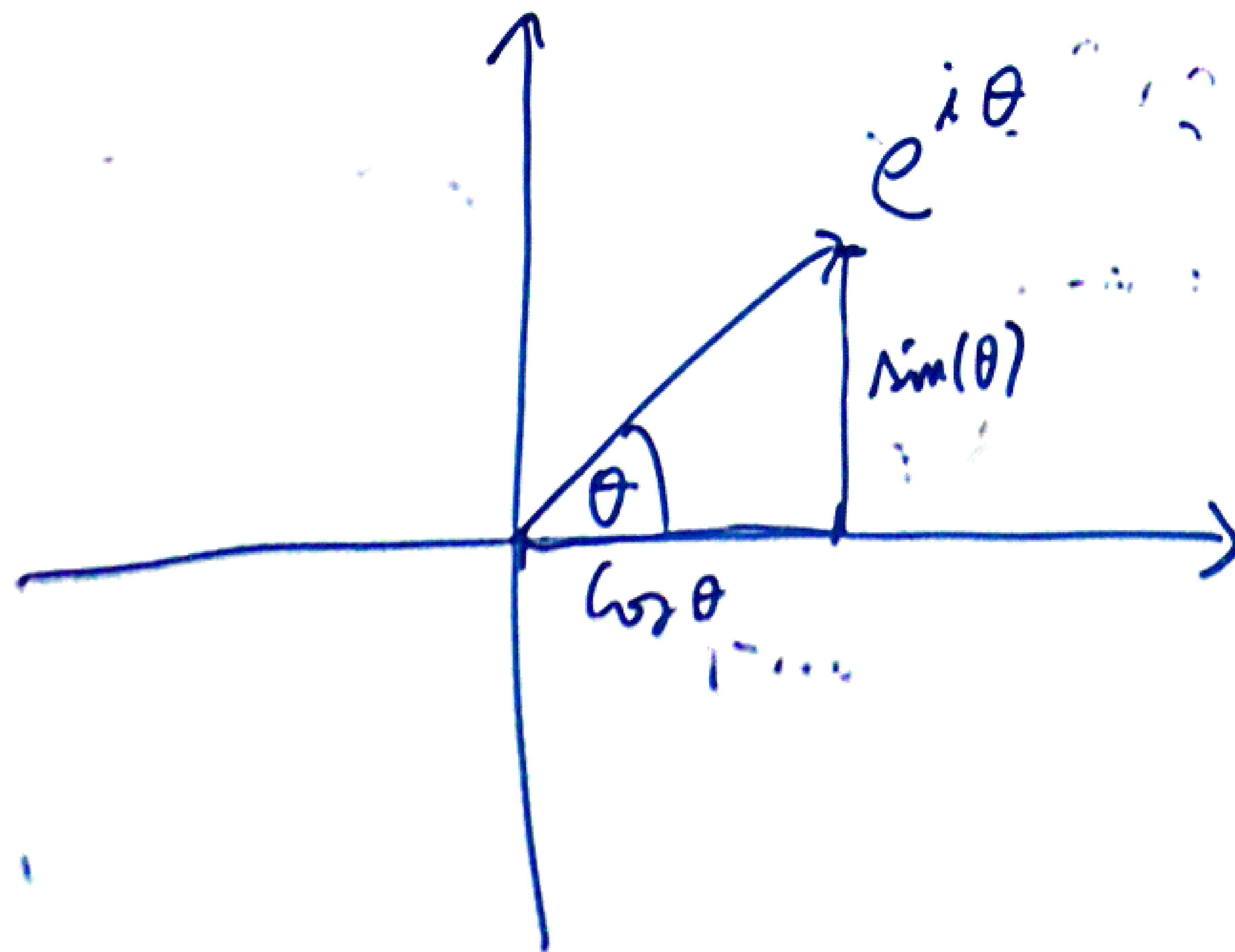
$$\begin{aligned}w_5 &= e^{\frac{2\pi i}{5}} = w_s^2 \\(w_s)^5 &= 1 \Rightarrow (w_s^2)^5 \\&\Rightarrow e^{\frac{2\pi i}{5} \cdot 2}\end{aligned}$$

$(r_0, \rho(r_0))$

$(r_1, \rho(r_1))$

$(r_2, \rho(r_2))$

$X^5 - 1$



$$w_5 = e^{\frac{2\pi i}{5}}$$

$$\left(e^{\frac{2\pi i}{5}}\right)^5$$

$$(w_5)^5 = 1 \quad (w_5^2)^5$$

$$e^{\frac{2\pi i}{5} \cdot 2}$$