1

321 . 278

$$321 \cdot 278$$

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

$$321 \cdot 278$$

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

$$321 \cdot 278$$

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

$$321 \cdot 278$$

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

$$321 \cdot 278$$

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

$$321 \cdot 278$$

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

$$(1,2,3)$$

$$321 \cdot 278$$

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

$$(1,2,3)$$

$$321 \cdot 278$$

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

c_i

$$321 \cdot 278$$

$$(\underset{a_2}{3}x^2 + \underset{a_1}{2}x + \underset{a_0}{1}) \cdot (\underset{b_2}{2}x^2 + \underset{b_1}{7}x + \underset{b_0}{8})$$

$$321 \cdot 278$$

$$\left(\underset{\substack{\uparrow\\ a_2}}{3}x^2+\underset{\substack{\uparrow\\ a_1}}{2}x+\underset{\substack{\uparrow\\ a_0}}{1}\right)\cdot\left(\underset{\substack{\uparrow\\ b_2}}{2}x^2+\underset{\substack{\uparrow\\ b_1}}{7}x+\underset{\substack{\\ b_0}}{8}\right)$$

$$c_3 = a_2 b_1$$

$$c_3 x^3$$

$$321 \cdot 278$$

$$(\underset{a_2}{3}x^2 + \underset{a_1}{2}x + \underset{a_0}{1}) \cdot (\underset{b_2}{2}x^2 + \underset{b_1}{7}x + \underset{b_0}{8})$$

$$c_3 = a_2 b_1 + a_1 \cdot b_2 = 3 \cdot 7 + 2 \cdot 2$$

$$= 25$$

$$c_3 x^3$$

$$321 \cdot 278$$

$$(\underset{a_2}{3}x^2 + \underset{a_1}{2}x + \underset{a_0}{1}) \cdot (\underset{b_2}{2}x^2 + \underset{b_1}{7}x + \underset{b_0}{8})$$

$$c_3 = a_2 b_1 + a_1 \cdot b_2 = 3 \cdot 7 + 2 \cdot 2 = 25$$

$$c_3 x^3$$

$$321 \cdot 278$$

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

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

$$c_3 = a_2 b_1 + a_1 \cdot b_2 = 3 \cdot 7 + 2 \cdot 2$$

$$= 25$$

$$c_3 x^3$$

$$321 \cdot 278$$

$$(\underset{a_2}{\overline{3}}x^2 + \underset{a_1}{2}x + \underset{a_0}{1}) \cdot (\underset{b_2}{2}x^2 + \underset{b_1}{\overline{7}}x + \underset{b_0}{8})$$

$$p \to (v_0, p(v_0)), \ldots, (v_{n-1}, p(v_{n-1}))$$

$$q \to (v_0, q(v_0)), \ldots, (v_{n-1}, q(v_{n-1}))$$

$$p+q \to (v_0, p(v_0)+q(v_0)), \ldots, (v_{n-1}, p(v_{n-1})+q(v_{n-1}))$$

$$321 \cdot 278$$

$$\left(\underset{\substack{\uparrow\\ a_2}}{\overline{3}}x^2+\underset{\substack{\uparrow\\ a_1}}{2}x+\underset{\substack{\uparrow\\ a_0}}{1}\right)\cdot\left(\underset{\substack{\uparrow\\ b_2}}{2}x^2+\underset{\substack{\uparrow\\ b_1}}{\overline{7}}x+\underset{b_0}{8}\right)$$

$$p \to (\omega_0, p(\omega_0)), \ldots, (\omega_{n-1}, p(\omega_{n-1}))$$

$$q \to (\omega_0, q(\omega_0)), \ldots, (\omega_{n-1}, q(\omega_{n-1}))$$

$$p+q \to (\omega_0, p(\omega_0)+q(\omega_0)), \ldots, (\omega_{n-1}, p(\omega_{n-1})+q(\omega_{n-1}))$$

$$321 \cdot 278$$

$$\left(\underset{a_2}{3}x^2 + \underset{a_1}{2}x + \underset{a_0}{1}\right) \cdot \left(\underset{b_2}{2}x^2 + \underset{b_1}{7}x + \underset{b_0}{8}\right)$$

$$p \to (v_0, p(v_0)), \ldots, (v_{n-1}, p(v_{n-1}))$$

$$q \to (v_0, q(v_0)), \ldots, (v_{n-1}, q(v_{n-1}))$$

$$p \cdot q \to (v_0, p(v_0) \cdot q(v_0)), \ldots, (v_{n-1}, p(v_{n-1}) \cdot q(v_{n-1}))$$

$$321 \cdot 278$$

$$(\underset{a_2}{\overline{3}}x^2 + \underset{a_1}{2}x + \underset{a_0}{1}) \cdot (\underset{b_2}{2}x^2 + \underset{b_1}{\overline{7}}x + \underset{b_0}{8})$$

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

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

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

$321 \cdot 278$

$$\big(\underset{\substack{\uparrow\\ a_2}}{3}x^2+\underset{\substack{\uparrow\\ a_1}}{2}x+\underset{\substack{\uparrow\\ a_0}}{1}\big)\cdot\big(\underset{\substack{\uparrow\\ b_2}}{2}x^2+\underset{\substack{\uparrow\\ b_1}}{7}x+\underset{\substack{\\ b_0}}{8}\big)$$

$2n-2$ $\quad p \rightarrow (v_0, p(v_0)), \ldots, (v_{n-1}, p(v_{n-1}))$

$2n-2$ $\quad q \rightarrow (v_0, q(v_0)), \ldots, (v_{n-1}, q(v_{n-1}))$

$p \cdot q \rightarrow (v_0, p(v_0)\cdot q(v_0)), \ldots, (v_{n-1}, p(v_{n-1})\cdot q(v_{n-1}))$

$$321 \cdot 278$$

$$(\underset{a_2}{\bar{3}}x^2 + \underset{a_1}{2}x + \underset{a_0}{1}) \cdot (\underset{b_2}{2}x^2 + \underset{b_1}{\bar{7}}x + \underset{b_0}{8})$$

$$2n-1 \longrightarrow p \to (v_0, p(v_0)), \ldots, (v_{n-1}, p(v_{n-1}))$$

$$2n-1 \longrightarrow q \to (v_0, q(v_0)), \ldots, (v_{n-1}, q(v_{n-1}))$$

$$p \cdot q \to (v_0, p(v_0) \cdot q(v_0)), \ldots, (v_{n-1}, p(v_{n-1}) \cdot q(v_{n-1}))$$

$$321 \cdot 278$$

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

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

$2n \longrightarrow p \to (r_0, p(r_0)), \ldots, (r_{n-1}, p(r_{n-1}))$

$2n \longrightarrow q \to (r_0, q(r_0)), \ldots, (r_{n-1}, q(r_{n-1}))$

$p \cdot q \to (r_0, p(r_0) \cdot q(r_0)), \ldots, (r_{n-1}, p(r_{n-1}) \cdot q(r_{n-1}))$

$$321 \cdot 278$$

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

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

$$2n \longrightarrow p \to (v_0, p(v_0)), \dots, (v_{n-1}, p(v_{n-1}))$$

$$2n \longrightarrow q \to (v_0, q(v_0)), \dots, (v_{n-1}, q(v_{n-1}))$$

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

$$321 \cdot 278$$

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

$$\underset{a_2}{\uparrow} \quad \underset{a_1}{\uparrow} \quad \underset{a_0}{\uparrow} \qquad \underset{b_2}{\uparrow} \quad \underset{b_1}{\uparrow} \quad b_0$$

$2n \longrightarrow p \to (\omega_0, p(\omega_0)), \ldots, (\omega_{n-1}, p(\omega_{n-1}))$

$2n \longrightarrow q \to (\omega_0, q(\omega_0)), \ldots, (\omega_{n-1}, q(\omega_{n-1}))$

$p \cdot q \to (\omega_0, p(\omega_0) \cdot q(\omega_0)), \ldots, (\omega_{n-1}, p(\omega_{n-1}) \cdot q(\omega_{n-1}))$

$p(x)$

$q(x)$

$\to (a_0, \ldots, a_{n-1})$

$321 \cdot 278$

$$(\underset{\substack{\uparrow \\ a_2}}{3}x^2 + \underset{\substack{\uparrow \\ a_1}}{2}x + \underset{\substack{\uparrow \\ a_0}}{1}) \cdot (\underset{\substack{\uparrow \\ b_2}}{2}x^2 + \underset{\substack{\uparrow \\ b_1}}{7}x + \underset{b_0}{8})$$

$r_0 \quad p(r_0)$

$\vdots$

$r_{n-1} \quad p(r_{n-1})$

$\longrightarrow p \to (r_0, p(r_0)), \ldots, (r_{n-1}, p(r_{n-1}))$

$\longrightarrow q \to (r_0, q(r_0)), \ldots, (r_{n-1}, q(r_{n-1}))$

$p \cdot q \to (r_0, p(r_0) \cdot q(r_0)), \ldots, (r_{n-1}, p(r_{n-1}) \cdot q(r_{n-1}))$

$p(x)$

$q(x)$

$\to (a_0, \ldots, a_{n-1})$

$321 \cdot 278$

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

$$\begin{array}{cccccc} a_2 & a_1 & a_0 & b_2 & b_1 & b_0 \end{array}$$

$2n-1 \quad n-1 \quad p \to \quad (v_0, p(v_0)), \ldots, (v_{n-1}, p(v_{n-1}))$

$2n-1 \quad n-1 \quad q \to \quad (v_0, q(v_0)), \ldots, (v_{n-1}, q(v_{n-1}))$

$2n-2 \quad p \cdot q \to \quad (v_0, p(v_0) \cdot q(v_0)), \ldots, (v_{n-1}, p(v_{n-1}) \cdot q(v_{n-1}))$

$\boxed{2n-1}$

$p(x)$

$q(x)$

$\to (a_0, \ldots, a_{n-1})$

$321 \cdot 278$

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

$a_2 \quad a_1 \quad a_0 \qquad b_2 \quad b_1 \quad b_0$

$2n-1 \quad n-1 \quad p \to (r_0, p(r_0)), \ldots, (r_{n-1}, p(r_{n-1}))$

$2n-1 \quad n-1, \; q \to (r_0, q(r_0)), \ldots, (r_{n-1}, q(r_{n-1}))$

$2n-2 \quad p \cdot q \to (r_0, p(r_0) \cdot q(r_0)), \ldots, (r_{n-1}, p(r_{n-1}) \cdot q(r_{n-1}))$

$\boxed{2n-1}$

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

$p(\omega)$

$321 \cdot 278$

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

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

$(\omega_0, p(\omega_0)), \ldots, (\omega_{n-1}, p(\omega_{n-1}))$

$(\omega_0, q(\omega_0)), \ldots, (\omega_{n-1}, q(\omega_{n-1}))$

$(\omega_0, p(\omega_0) \cdot q(\omega_0)), \ldots, (\omega_{n-1}, p(\omega_{n-1}) \cdot q(\omega_{n-1}))$

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

$p(r)$

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

$$321 \cdot 278$$

$$(\underset{a_2}{3}x^2 + \underset{a_1}{2}x + \underset{a_0}{1}) \cdot (\underset{b_2}{2}x^2 + \underset{b_1}{7}x + \underset{b_0}{8})$$

$(r_0, p(r_0)), \ldots, (r_{n-1}, p(r_{n-1}))$

$(r_0, q(r_0)), \ldots, (r_{n-1}, q(r_{n-1}))$

$(r_0, p(r_0) \cdot q(r_0)), \ldots, (r_{n-1}, p(r_{n-1}) \cdot q(r_{n-1}))$

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

$$p(r)$$

$$a_0 + a_1 \cdot r + a_2 \cdot r^2 + a_3 \cdot r^3$$

$$\rightarrow O(n)$$

$$321 \cdot 278$$

$$\left(\underset{a_2}{\overline{3}}x^2 + \underset{a_1}{2}x + \underset{a_0}{1}\right) \cdot \left(\underset{b_2}{2}x^2 + \underset{b_1}{\overline{7}}x + \underset{b_0}{8}\right)$$

$$(r_0, p(r_0)), \ldots, (r_{n-1}, p(r_{n-1}))$$

$$(r_0, q(r_0)), \ldots, (r_{n-1}, q(r_{n-1}))$$

$$(r_0, p(r_0) \cdot q(r_0)), \ldots, (r_{n-1}, p(r_{n-1}) \cdot q(r_{n-1}))$$

$(N_0, W_0) \quad (N_1, W_1) \quad (N_2, W_2)$

$$(x_0, p(x_0)) \quad (x_1, p(x_1)) \quad (x_2, p(x_2))$$

$$
\begin{aligned}
p(x)' = \; & p(x_0) \\
& + p(x_1) \cdot (x - x_0) \\
& + p(x_2) \cdot (x - x_0)
\end{aligned}
$$

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

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

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

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

$(x_0, p(x_0)) \quad (x_1, p(x_1)) \quad (x_2, p(x_2))$

$$p(x) = p(x_0)\cdot\frac{(x-x_1)(x-x_2)}{(x_0-x_1)(x_0-x_2)} + p(x_1)\cdot\frac{(x-x_0)(x-x_2)}{(x_1-x_0)\cdot(x_1-x_2)} + p(x_2)\frac{(x-x_0)(x-x_1)}{(x_2-x_0)(x_2-x_1)}$$

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

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

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

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

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

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

$(x_0, p(x_0)) \quad (x_1, p(x_1)) \quad (x_2, p(x_2))$

$$p(x) = p(x_0)\cdot\frac{(x-x_1)(x-x_2)}{(x_0-x_1)(x_0-x_2)} + p(x_1)\cdot\frac{(x-x_0)(x-x_2)}{(x_1-x_0)\cdot(x_1-x_2)} + p(x_2)\frac{(x-x_0)(x-x_1)}{(x_2-x_0)(x_2-x_1)}$$

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

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

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

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

$(x_0, p(x_0))$ $(x_1, p(x_1))$ $(x_2, p(x_2))$

$p(X)$

$(a_0, \ldots, a_{n-1})$

$$p(X) = p(x_0)\,\frac{(X-x_1)(X-x_2)}{(x_0-x_1)(x_0-x_2)} + p(x_1)\cdot\frac{(X-x_0)(X-x_2)}{(x_1-x_0)\cdot(x_1-x_2)} + p(x_2)\,\frac{(X-x_0)(X-x_1)}{(x_2-x_0)(x_2-x_1)}$$

$(x_0, p(x_0))$

$\vdots$

$(x_n, p(x_{n-1}))$

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

$p(x)$

$(a_0, \ldots, a_{n-1})$

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

$(v_0, p(v_0))$

$\vdots$

$(v_{n-1}, p(v_{n-1}))$

$$T(n) = 2\,T\left(\frac{n}{2}\right) + c \cdot n$$

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

$p(x)$

$(a_0, \ldots, a_{n-1})$

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

$(v_0, p(v_0))$

$(v_{n-1}, p(v_{n-1}))$

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

$(x_0, p(x_0))$ $(x_1, p(x_1))$ $(x_2, p(x_2))$

$p(x)$

$(a_0, \ldots, a_{n-1})$

$$p(x) = p(x_0) \cdot \frac{(x - x_1)(x - x_2)}{(x_0 - x_1)(x_0 - x_2)} + p(x_1) \cdot \frac{(x - x_0)(x - x_2)}{(x_1 - x_0) \cdot (x_1 - x_2)} + p(x_2) \frac{(x - x_0)(x - x_1)}{(x_2 - x_0)(x_2 - x_1)}$$

$(x_0, p(x_0))$

$(x_{n-1}, p(x_{n-1}))$

$$T(n) = 2\,T\left(\frac{n}{2}\right) + c \cdot n$$

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

$p(x)$

$(a_0, \ldots, a_{n-1})$

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

$(v_0, p(v_0))$

$(v_{n-1}, p(v_{n-1}))$

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

$(x_0, p(x_0))$ $(x_1, p(x_1))$ $(x_2, p(x_2))$

$p(x)$

$(a_0, \ldots, a_{n-1})$

$$p(x) = p(x_0)\frac{(x-x_1)(x-x_2)}{(x_0-x_1)(x_0-x_2)} + p(x_1)\cdot\frac{(x-x_0)(x-x_2)}{(x_1-x_0)\cdot(x_1-x_2)} + p(x_2)\frac{(x-x_0)(x-x_1)}{(x_2-x_0)(x_2-x_1)}$$

$(x_0, p(x_0))$

$(x_{n-1}, p(x_{n-1}))$

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

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

$p(x)$

$(a_0, \ldots, a_{n-1})$

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

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

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

$x^4 - 1$

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

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

$$p(x)$$

$$(a_0, \dots, a_{n-1})$$

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

$$x^4 - 1$$

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

$$T(n) = 2\,T\left(\frac{n}{2}\right) + c \cdot n$$

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

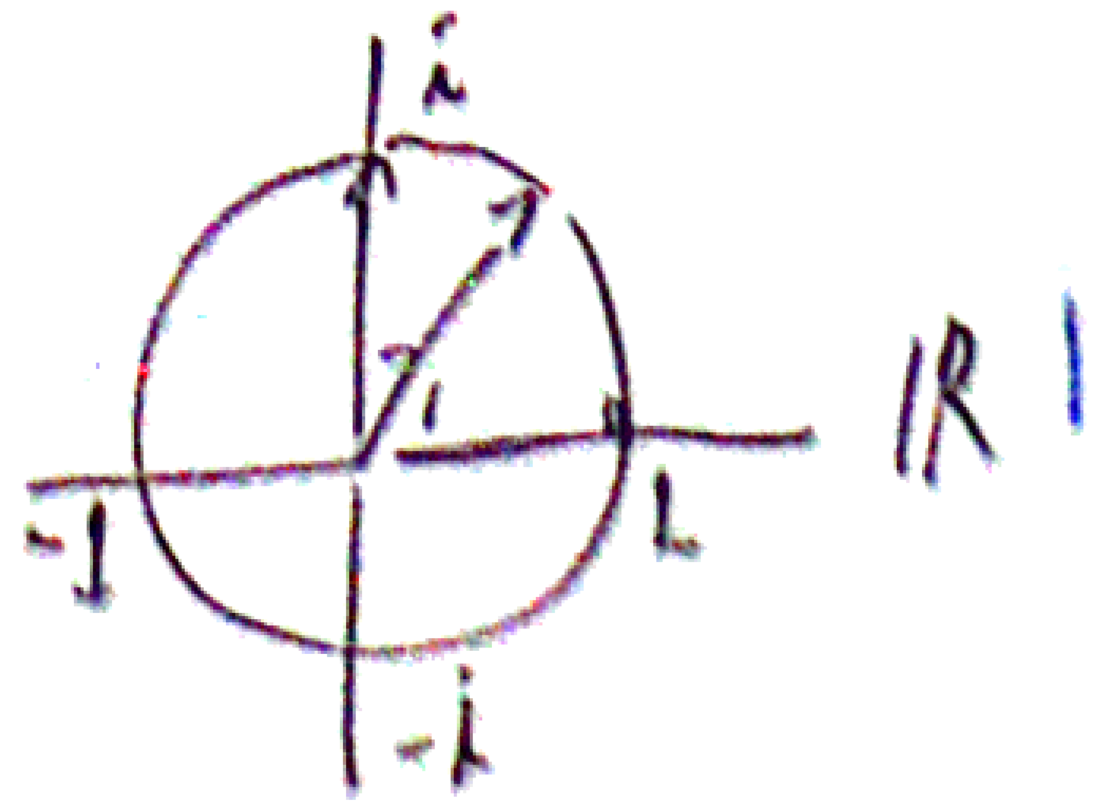
$$p(x)$$

$$(a_0, \ldots, a_{n-1})$$

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

$$x^4 - 1$$

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

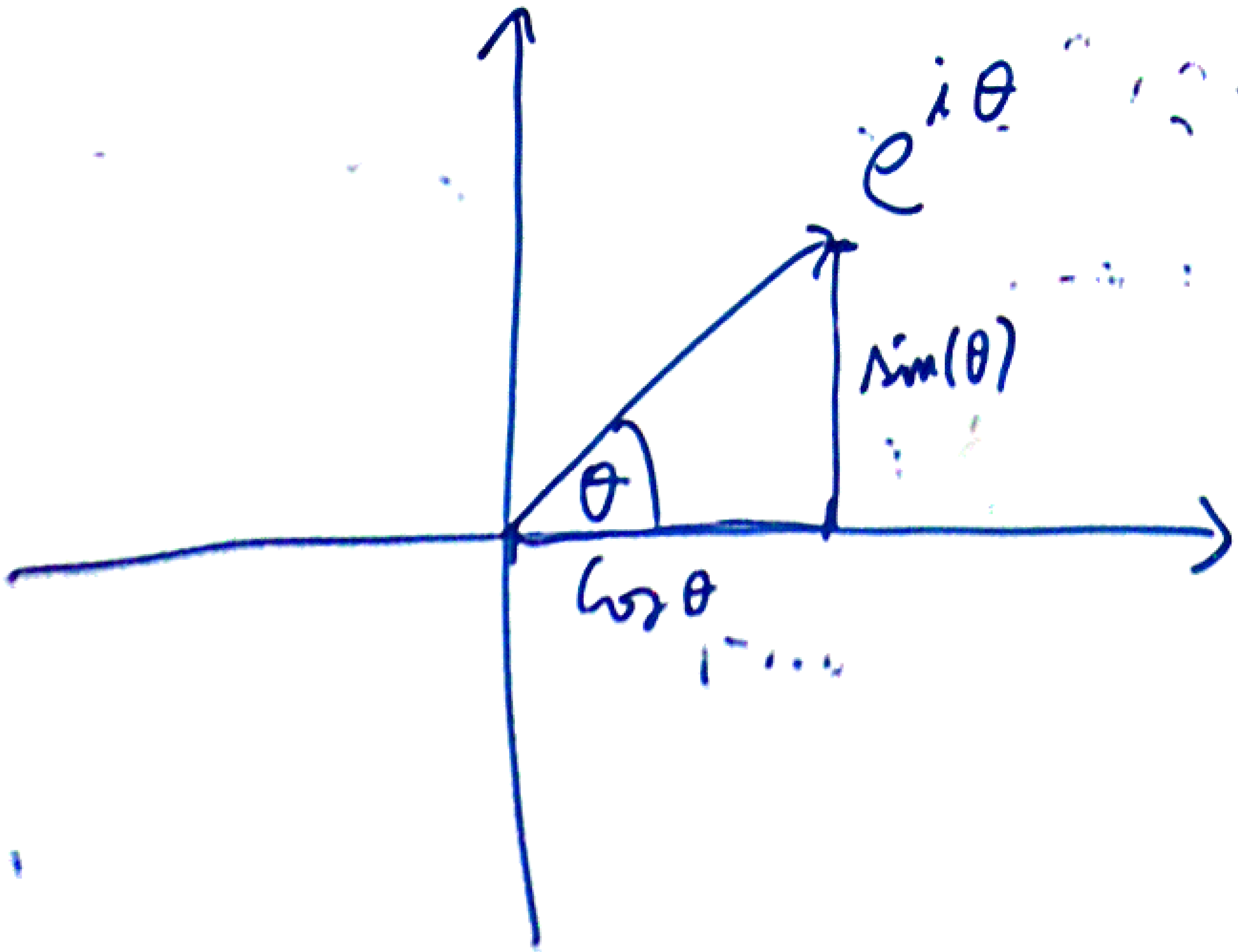


$$T(n) = 2T\left(\frac{n}{2}\right) + c \cdot n$$

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

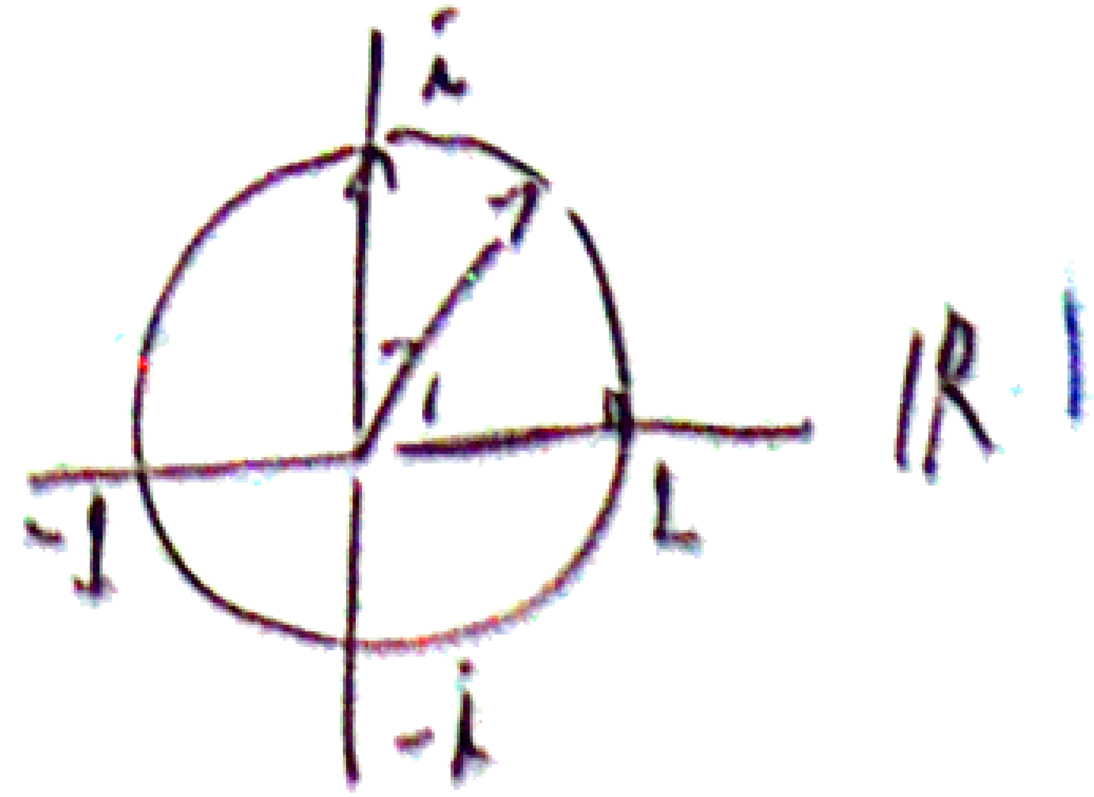
$p(x)$

$(a_0, \ldots, a_{n-1})$



$$x^4 - 1$$

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

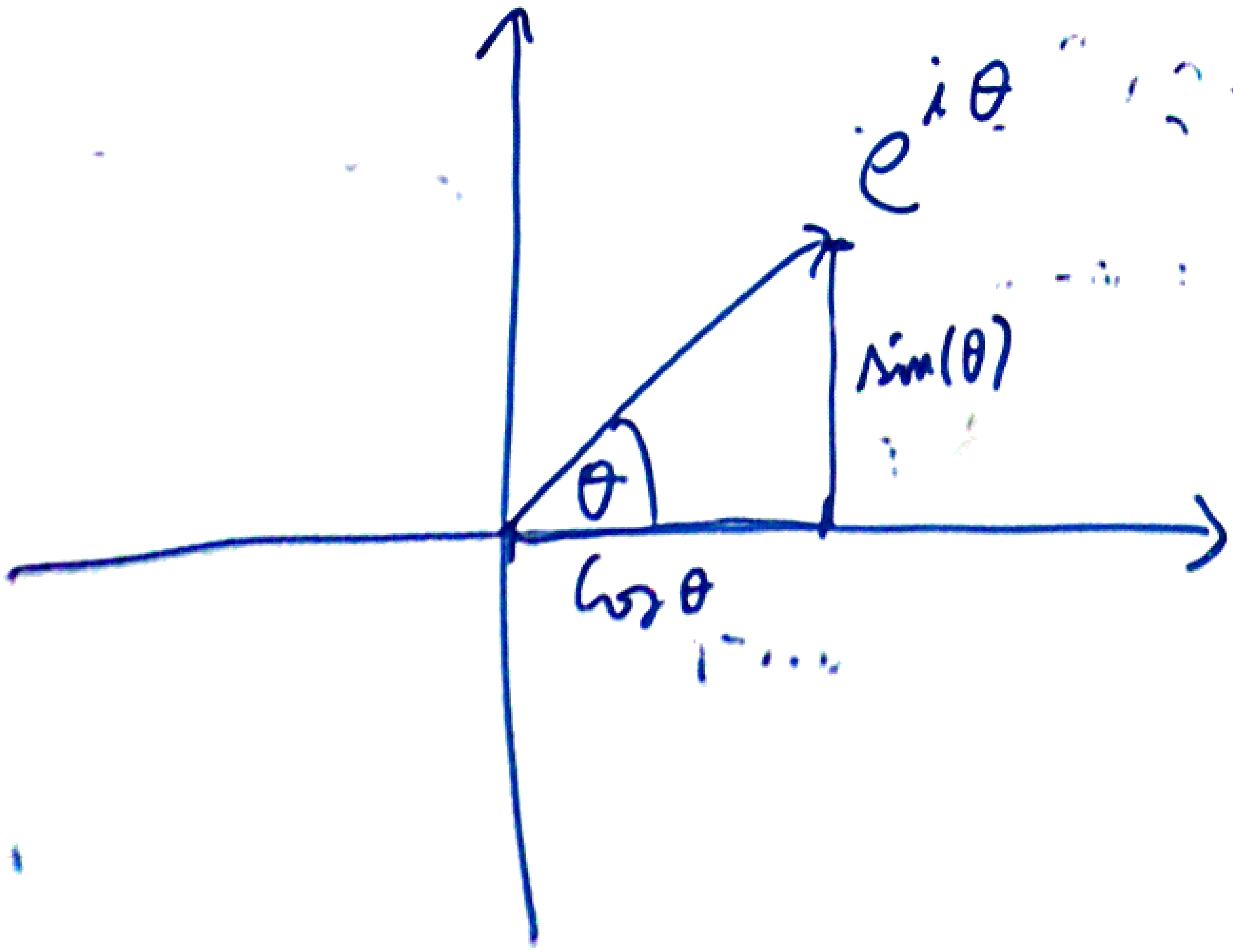


$$T(n) = 2T\left(\frac{n}{2}\right) + c \cdot n$$

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

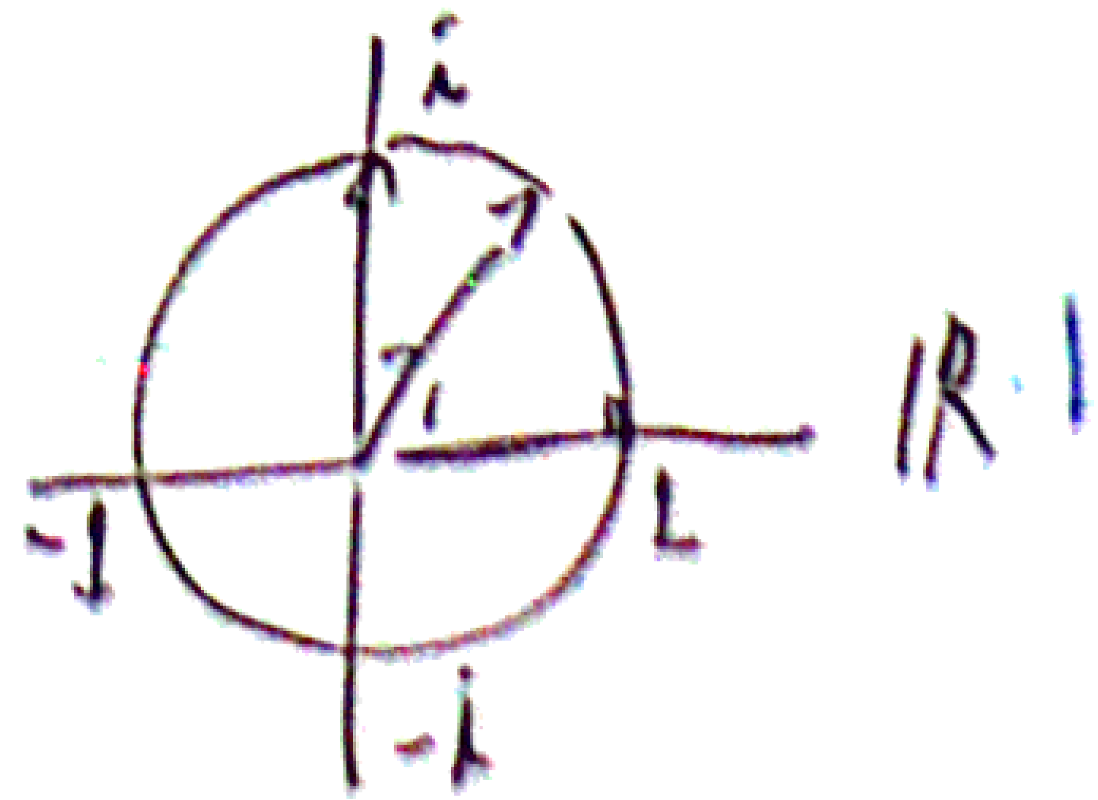
$p(x)$

$(a_0, \dots, a_{n-1})$



$x^4 - 1$

$1, i, -i, -1$

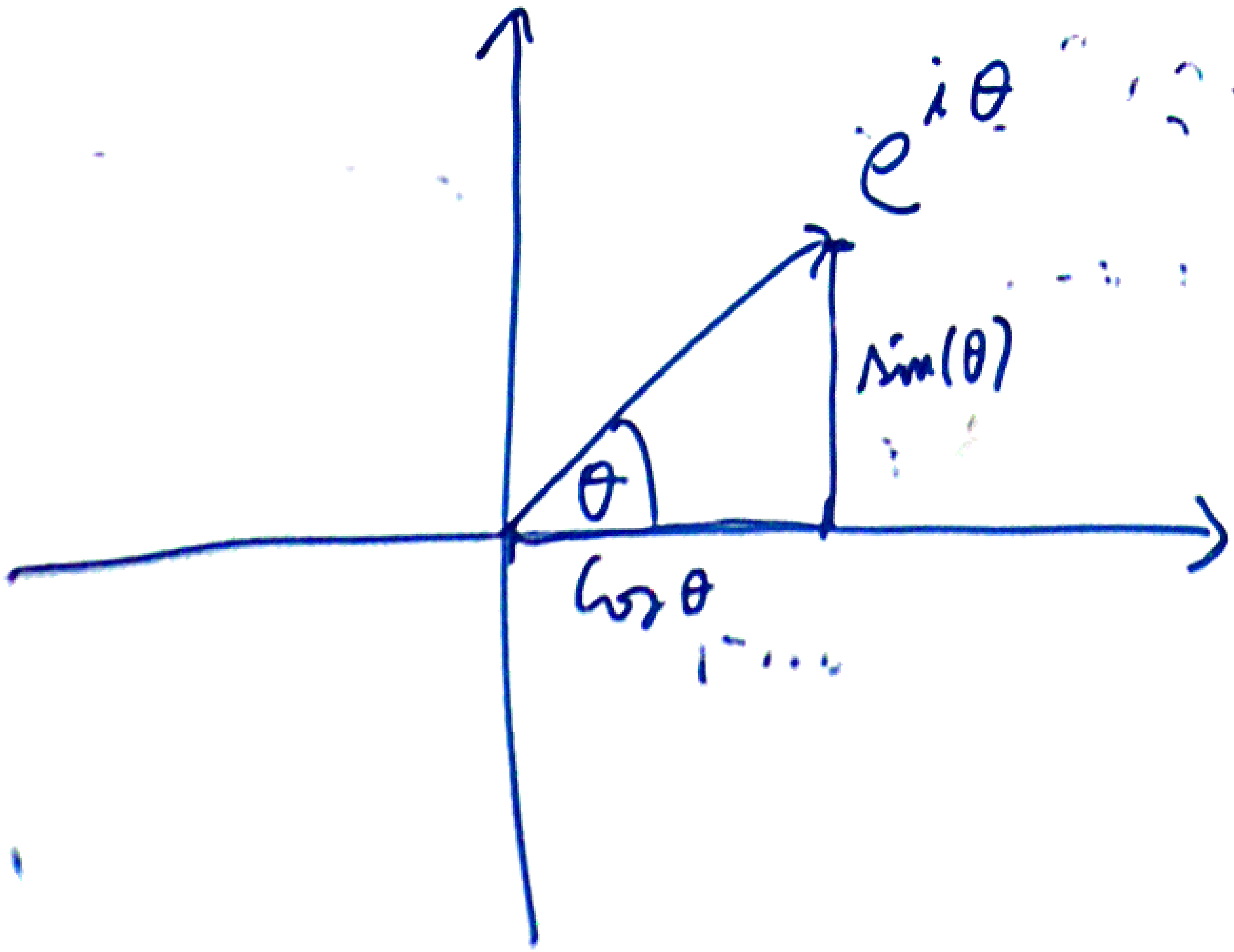


$$T(n) = 2T\left(\frac{n}{2}\right) + c \cdot n$$

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

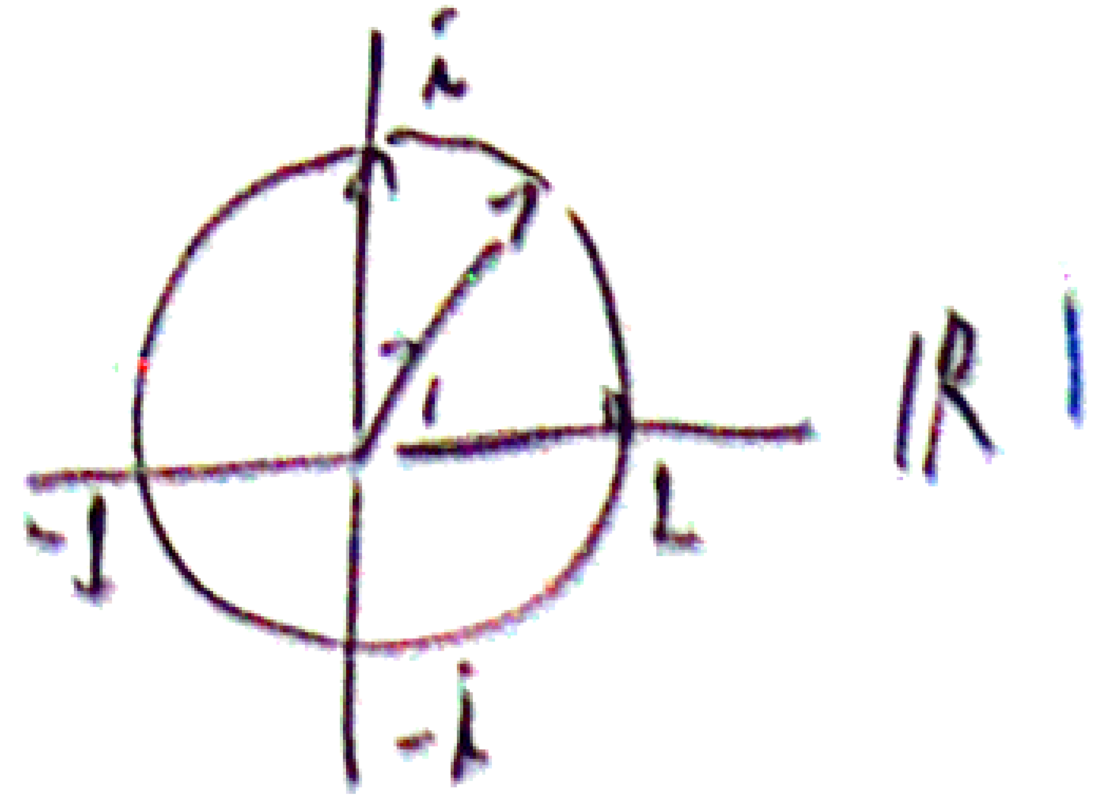
$p(x)$

$(a_0, \ldots, a_{n-1})$



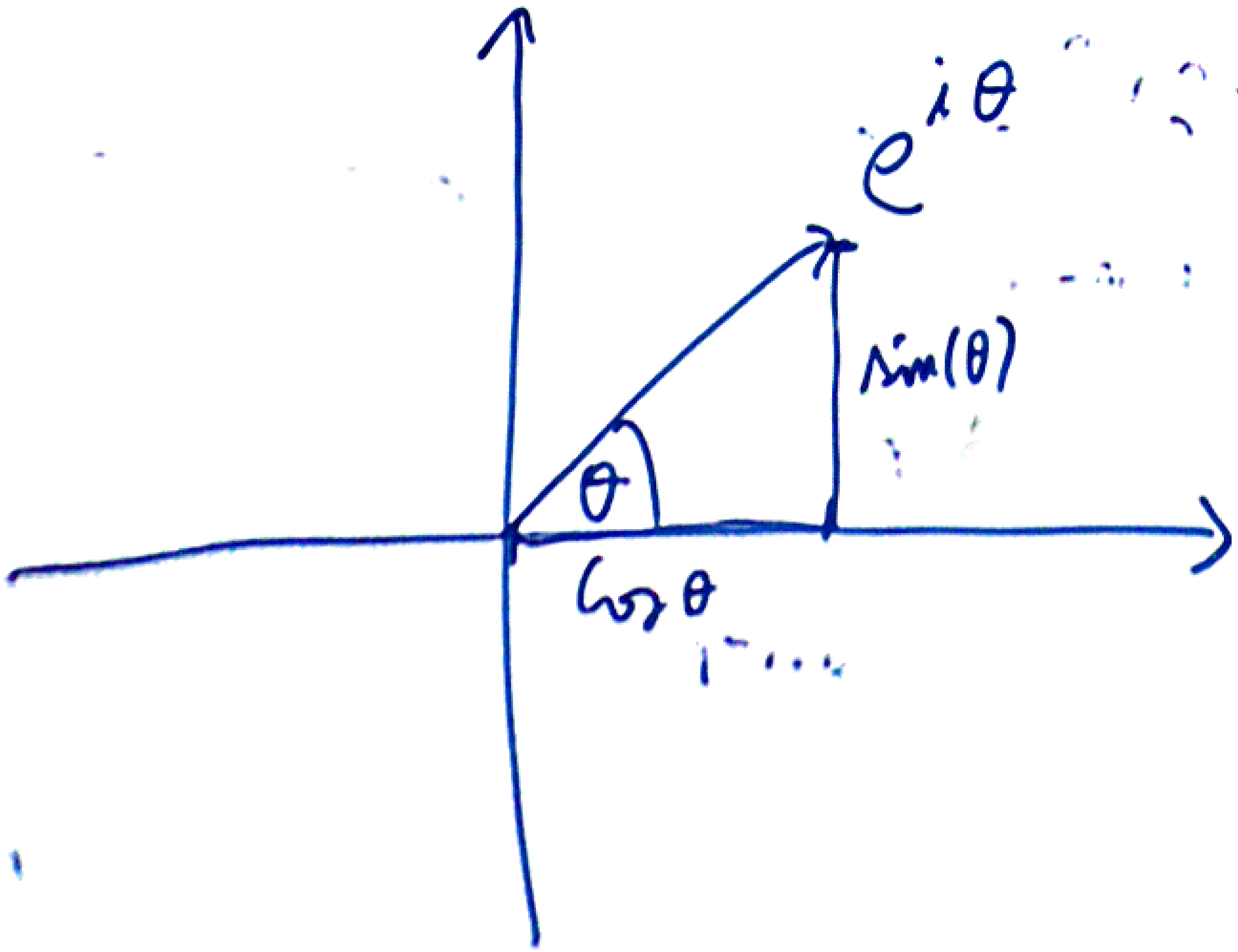
$x^4 - 1$

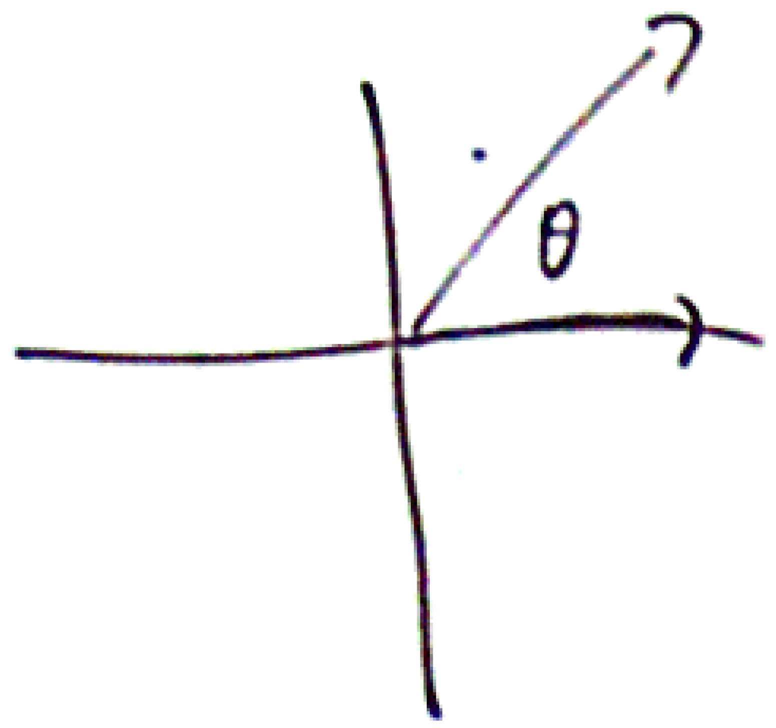
$1, i, -i, -1$



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

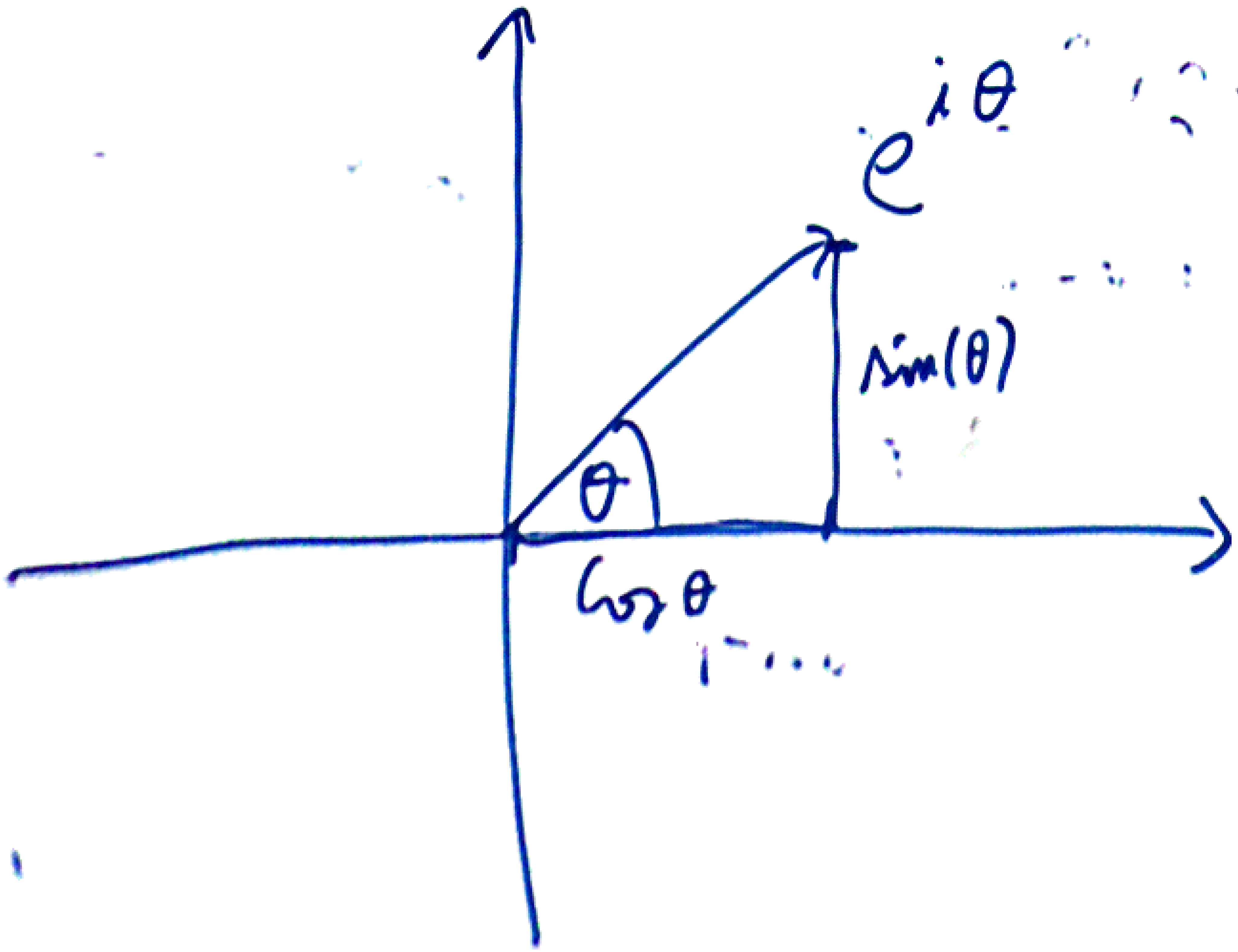
$X^4 - 1$





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

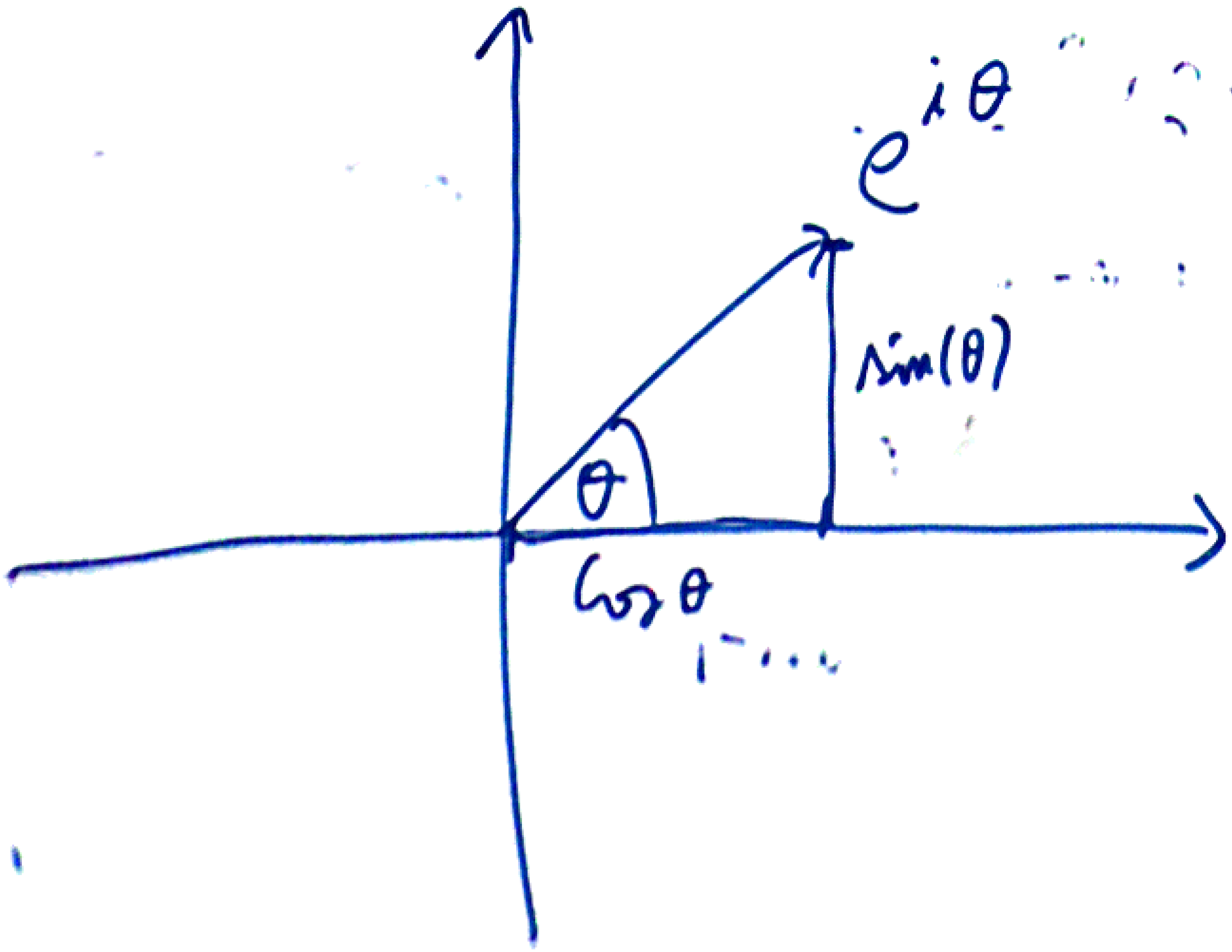
$X^5 - 1$



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

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

$X^5 - 1$

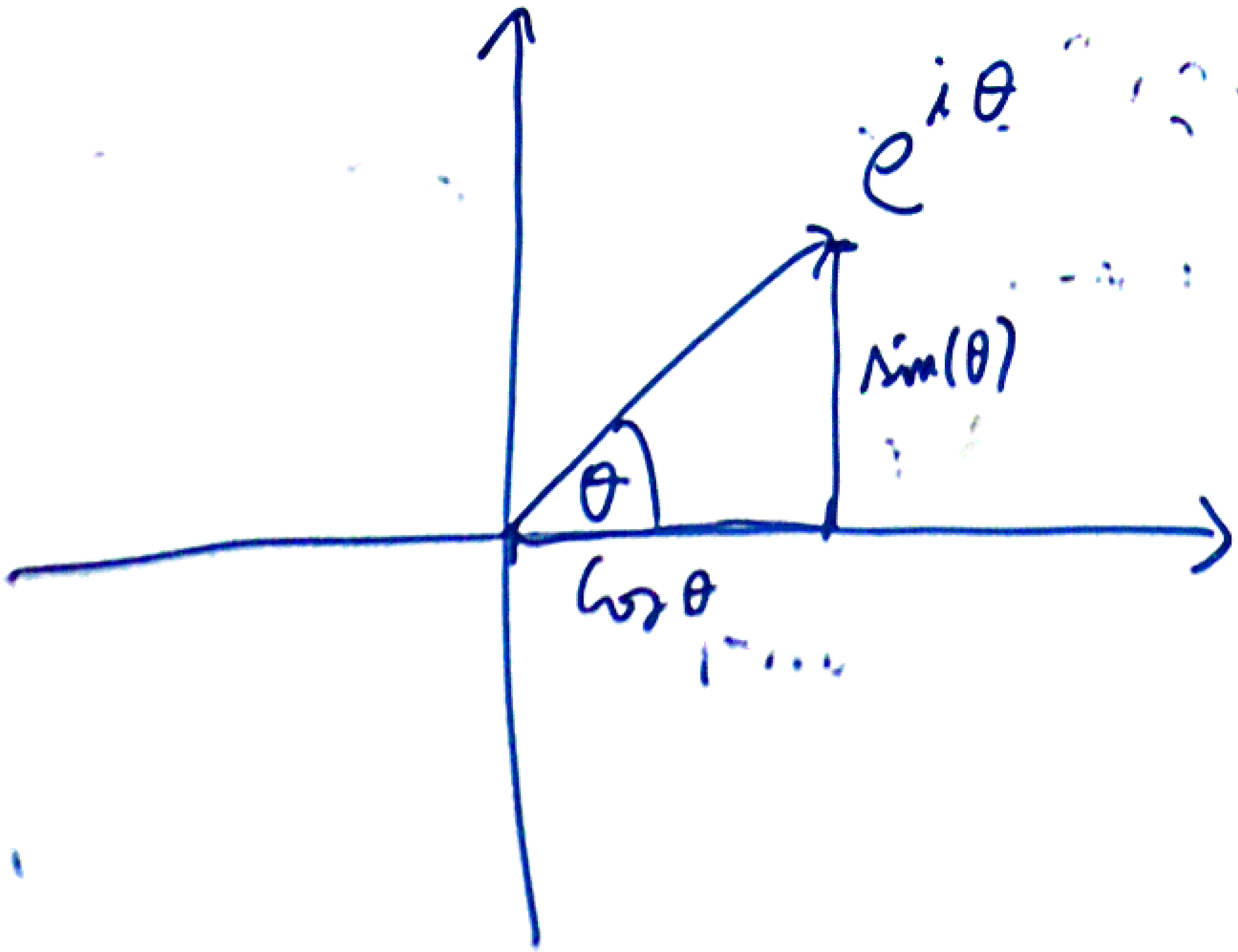


$$w_5 = e^{\frac{2\pi i}{5}}$$

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

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

$X^5 - 1$



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

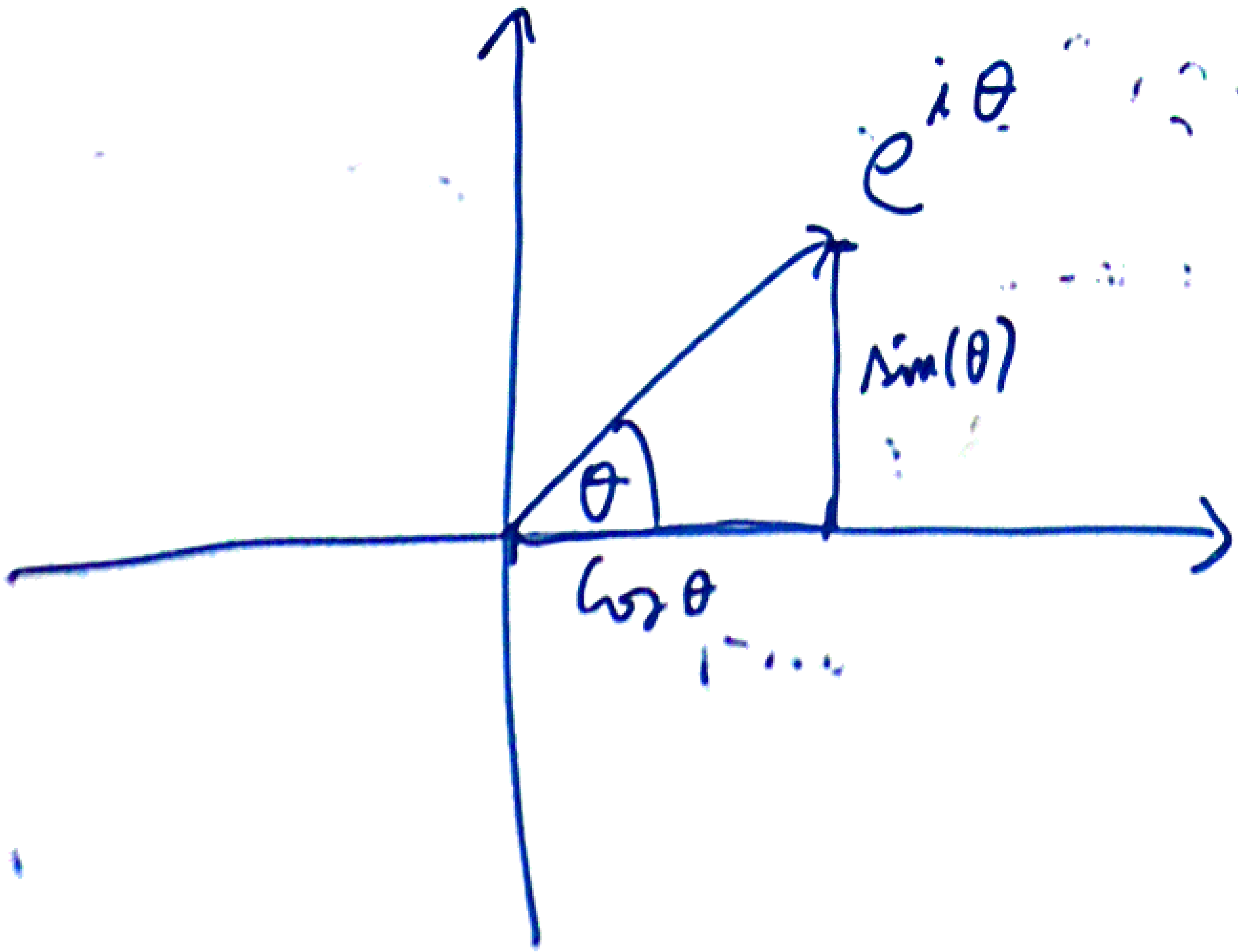
$\left(e^{\frac{2\pi i}{5}}\right)^5$

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

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

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

$X^5 - 1$



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

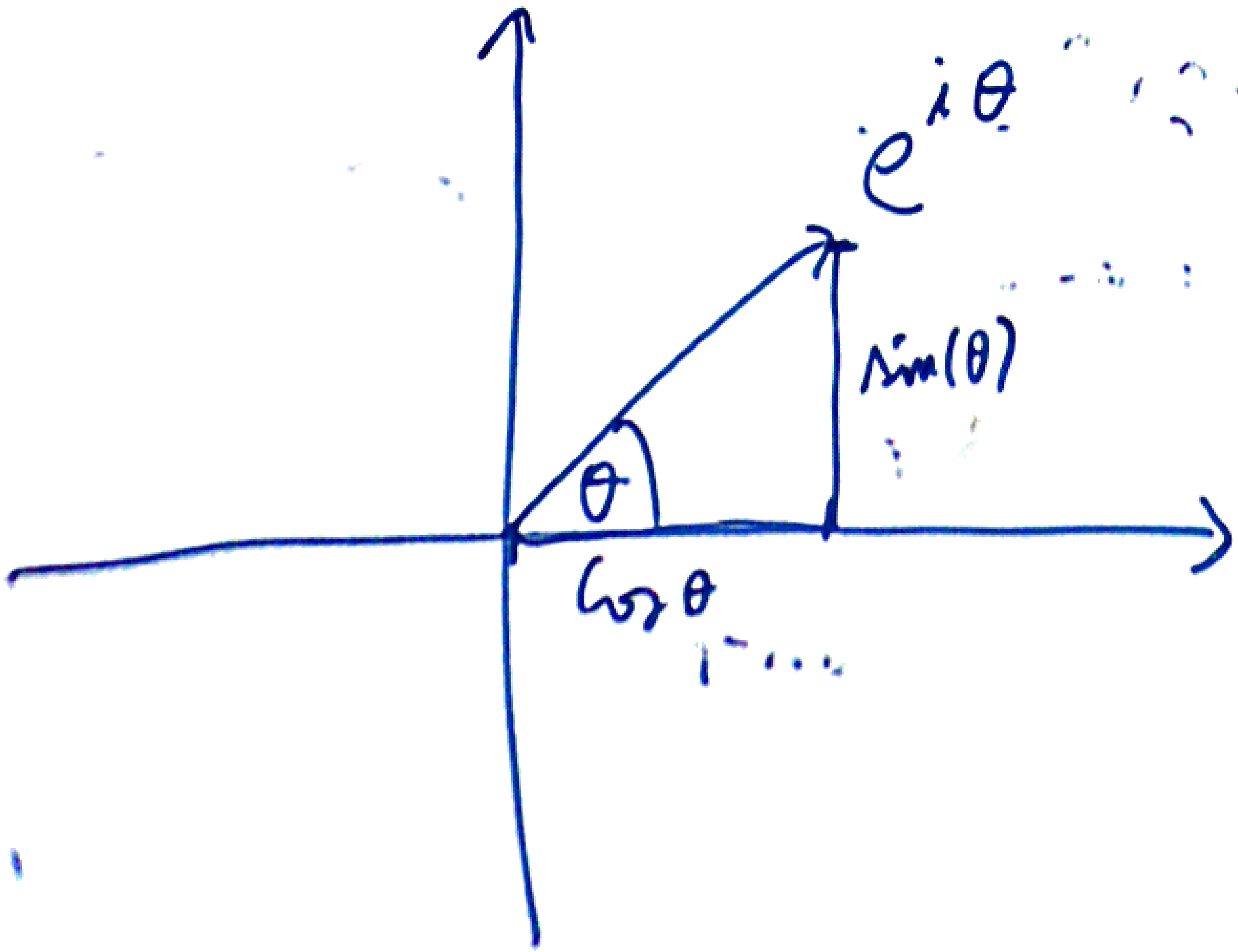
$\left(e^{\frac{2\pi i}{5}}\right)^5$

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

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

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

$X^5 - 1$



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

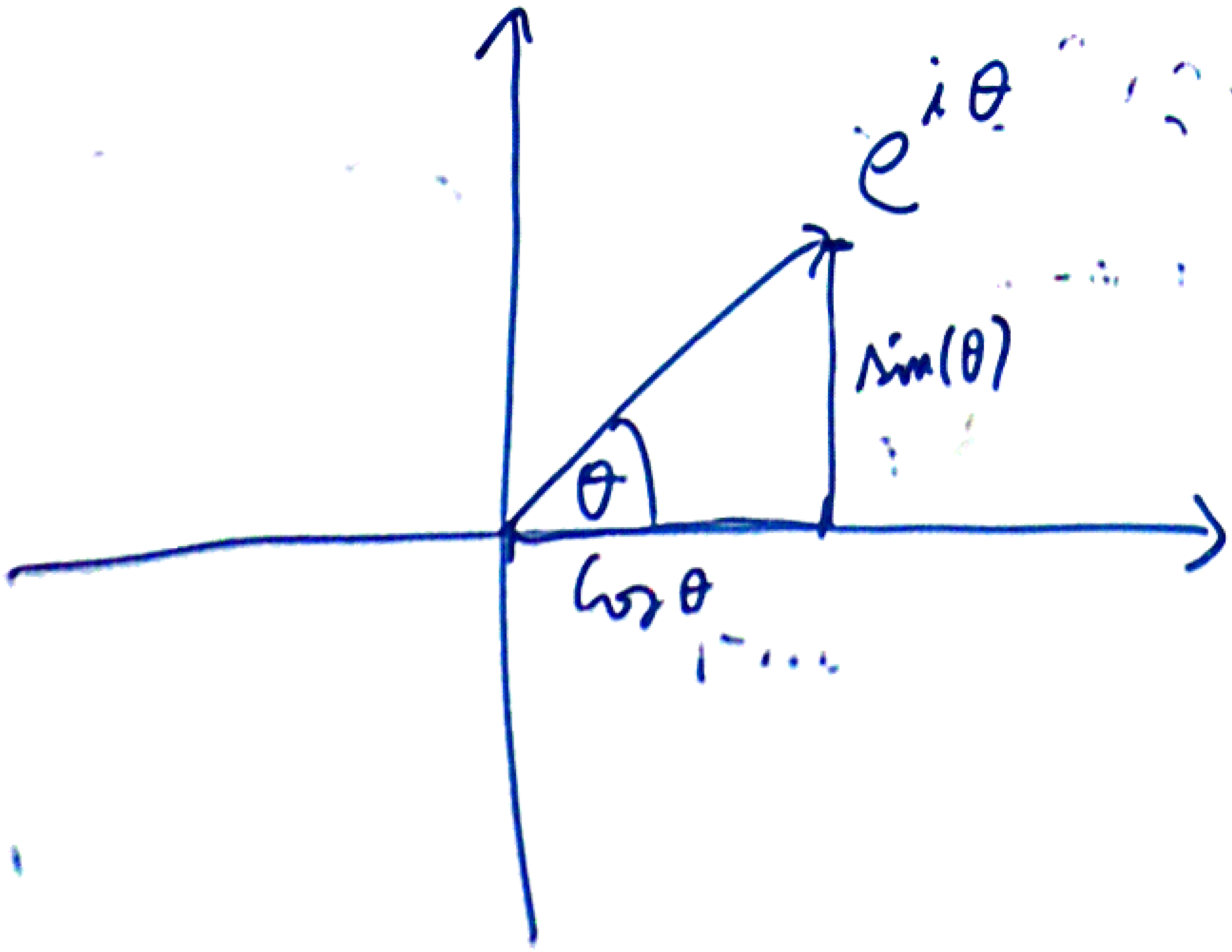
$\left(e^{\frac{2\pi i}{5}}\right)^5$

$(w_5)^5 = 1$, $(w_5^2)^5$

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

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

$X^5 - 1$



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

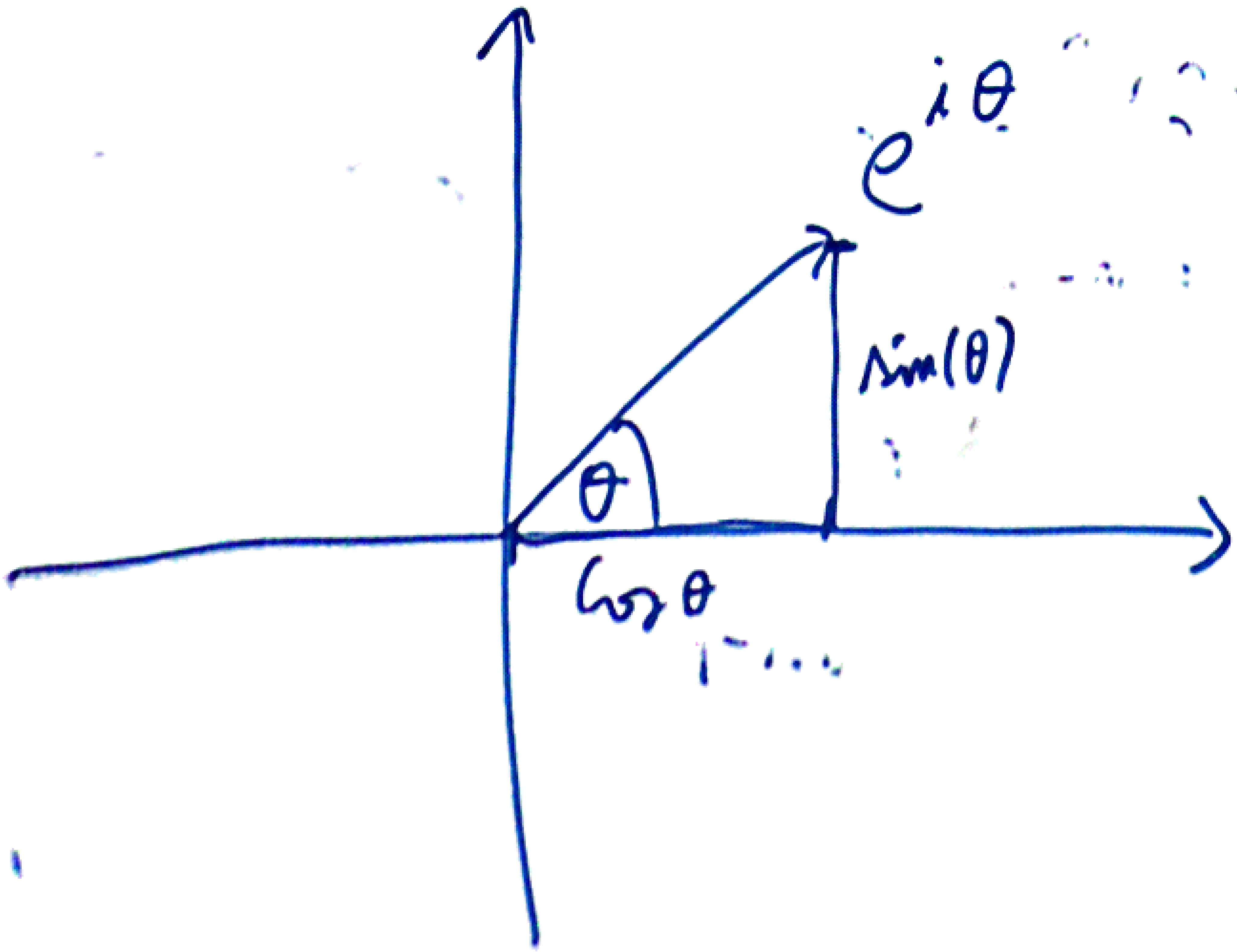
$$\left(e^{\frac{2\pi i}{5}}\right)^5$$

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

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

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

$X^5 - 1$



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

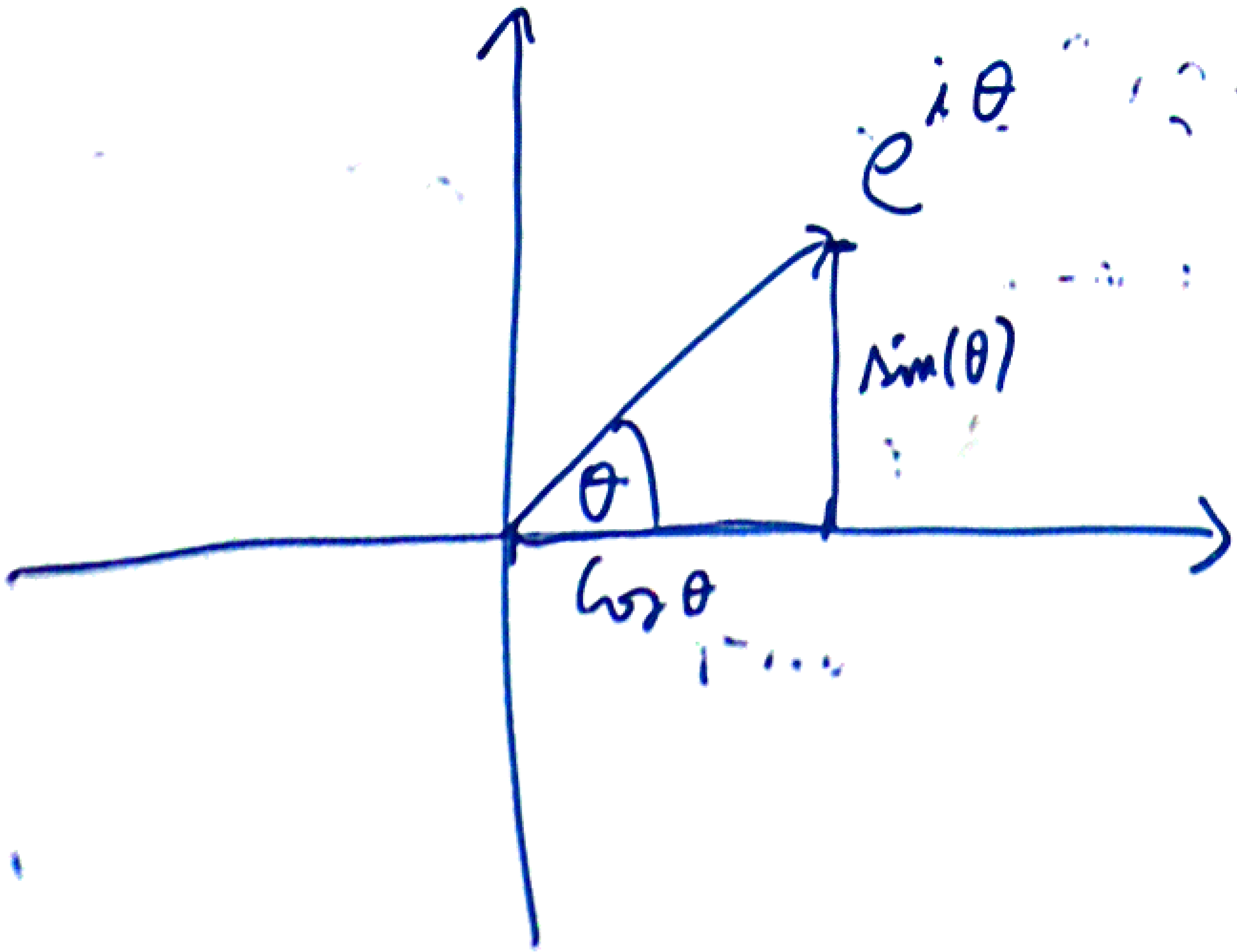
$\left(e^{\frac{2\pi i}{5}}\right)^5$

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

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

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

$X^5 - 1$



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

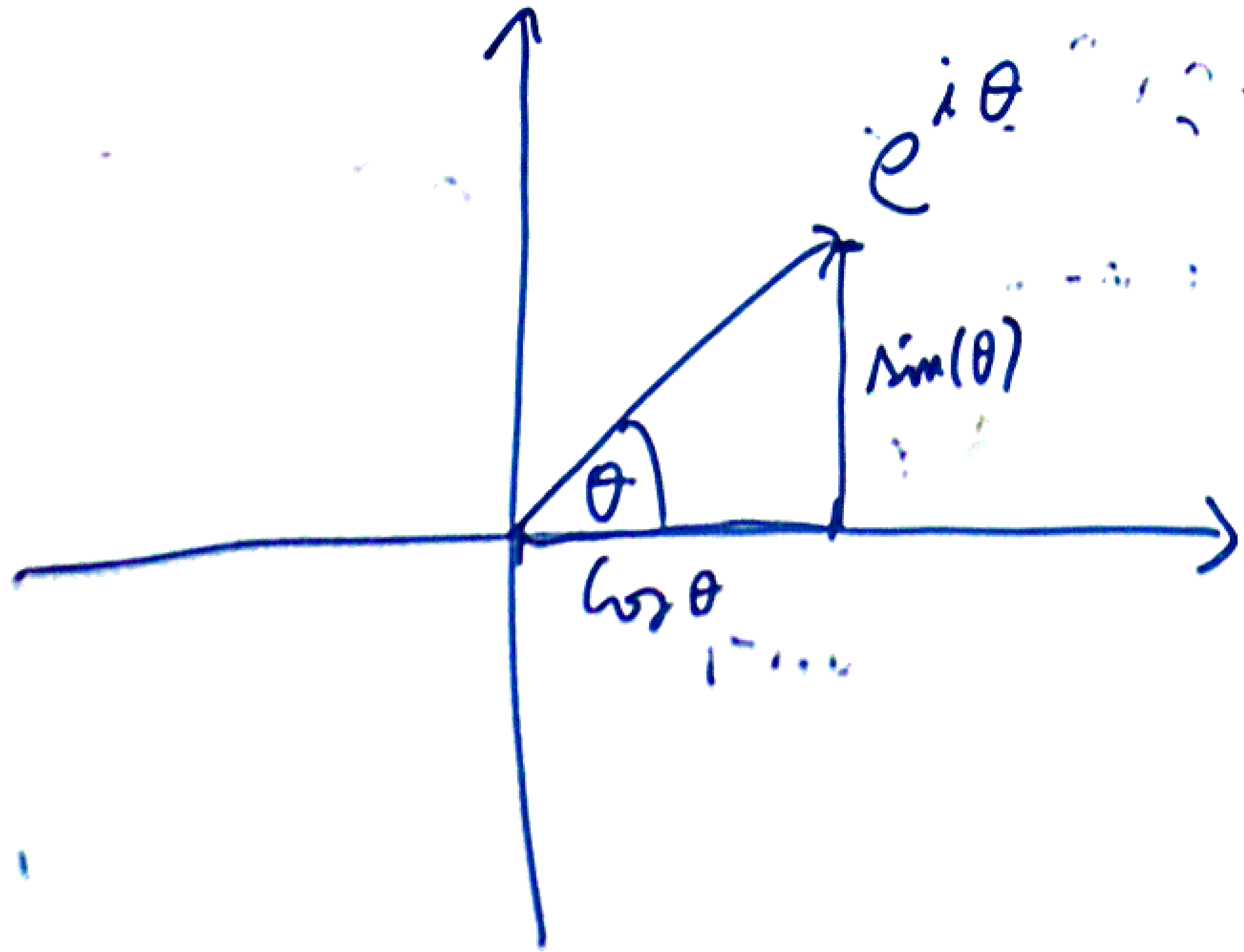
$$\left(e^{\frac{2\pi i}{5}}\right)^5$$

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

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

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

$X^5 - 1$



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

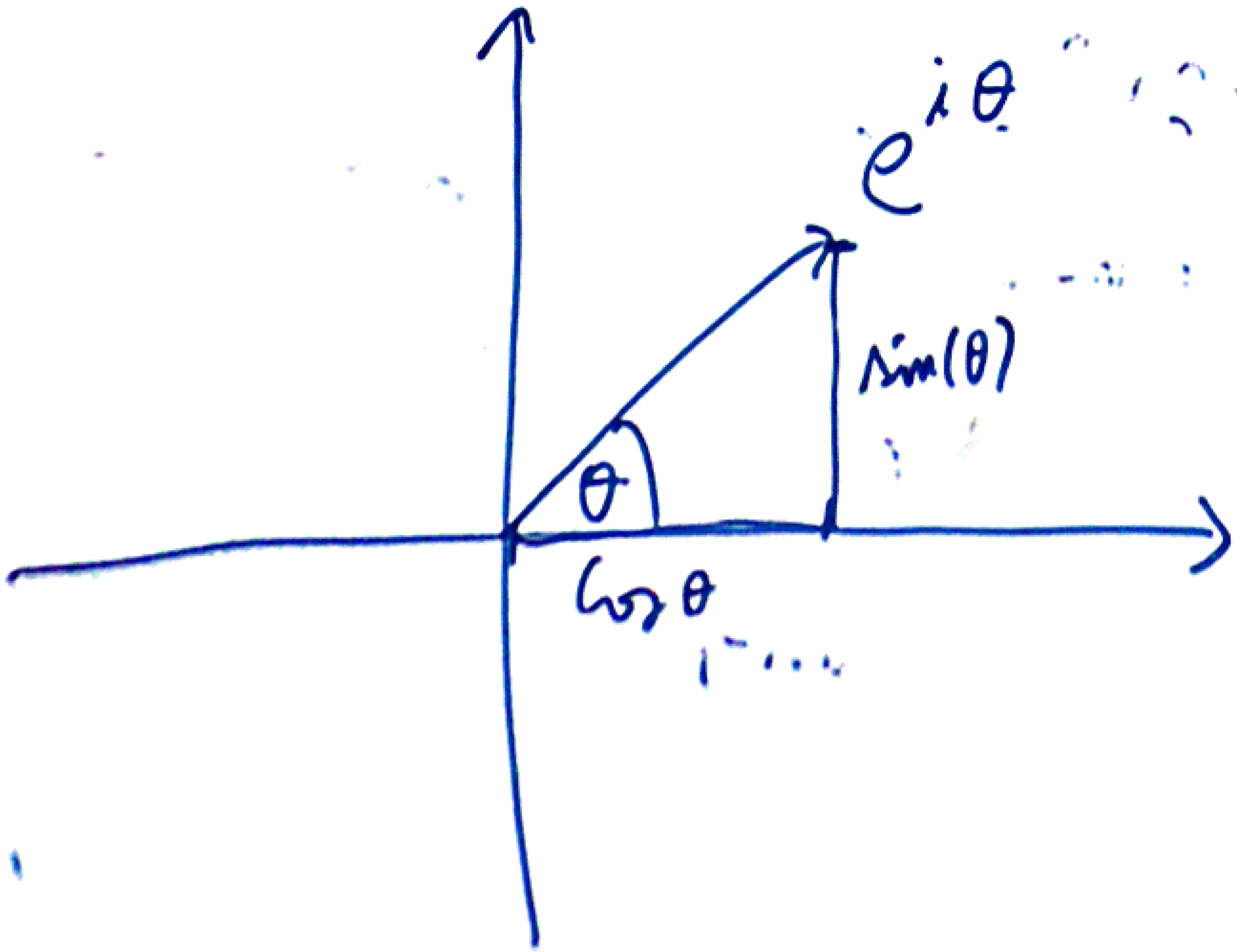
$\left(e^{\frac{2\pi i}{5}}\right)^5$

$(w_5)^5 = 1$, $(w_5^2)^5$

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

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

$X^5 - 1$



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

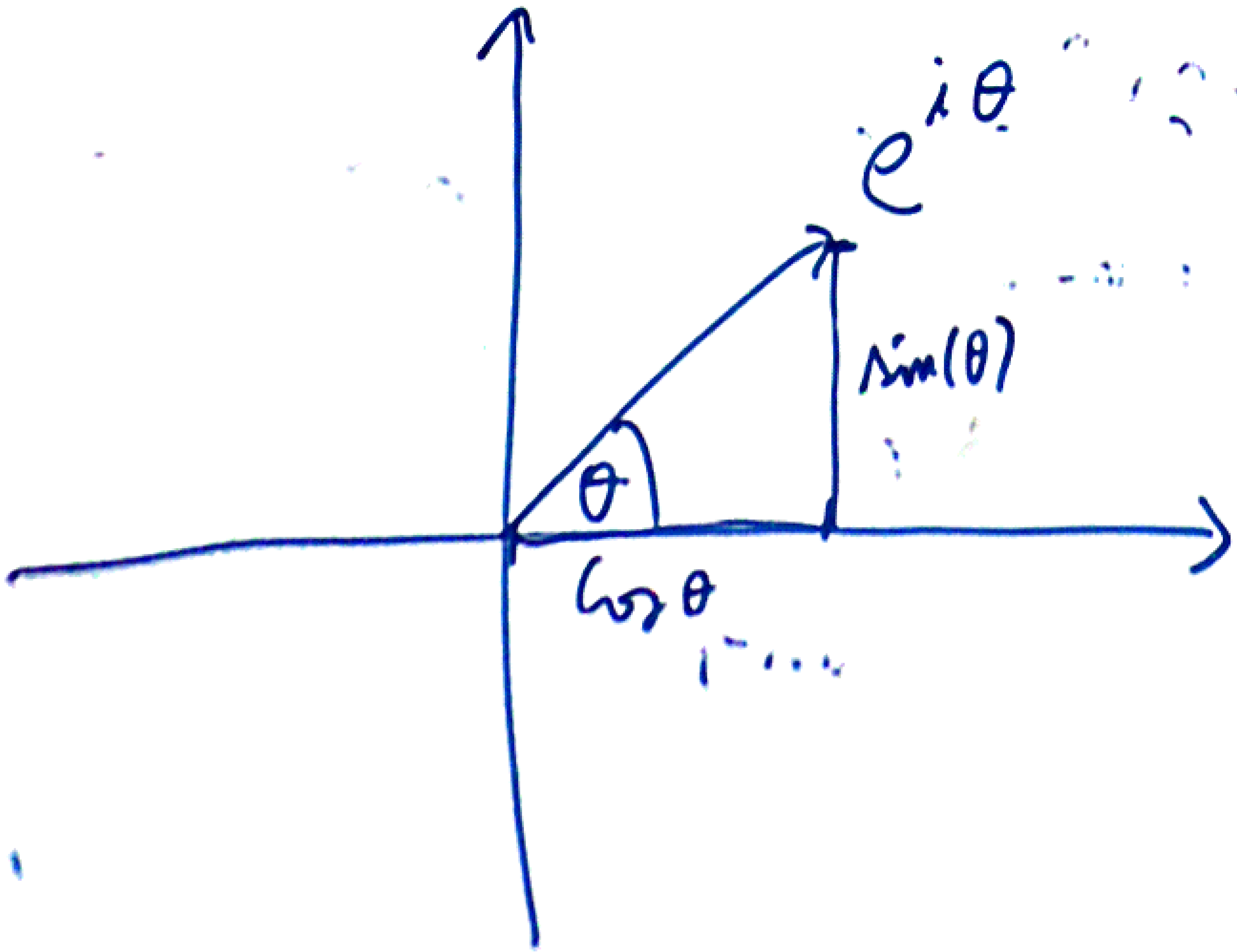
$\left(e^{\frac{2\pi i}{\cancel{5}}}\right)^{\cancel{5}}$

$(w_5)^5 = 1$ $(w_5^i)^5$

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

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

$X^5 - 1$



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

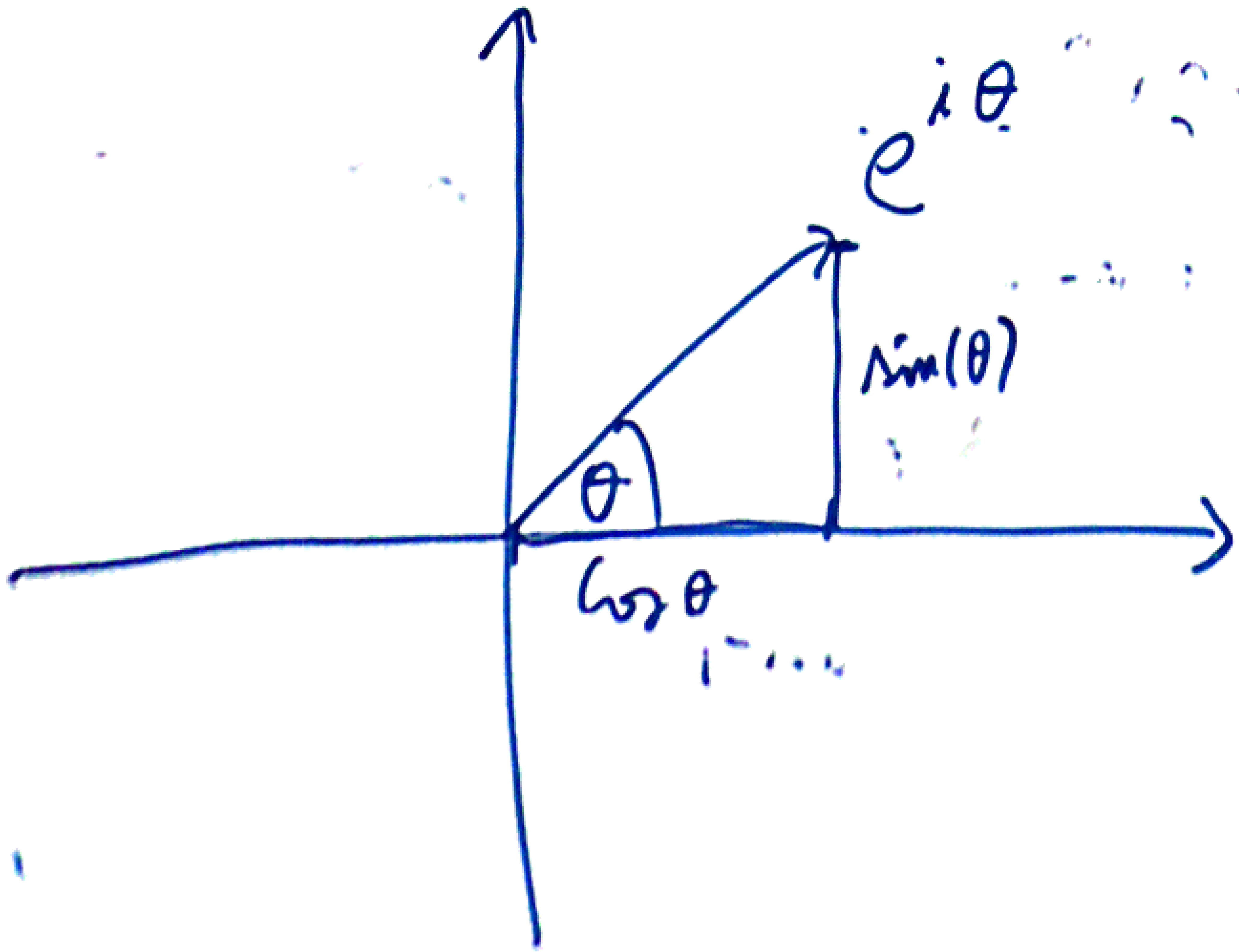
$$\left(e^{\frac{2\pi i}{5}}\right)^5$$

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

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

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

$X^5 - 1$



$\omega_5 = e^{\frac{2\pi i}{5}}$ ω_5^2

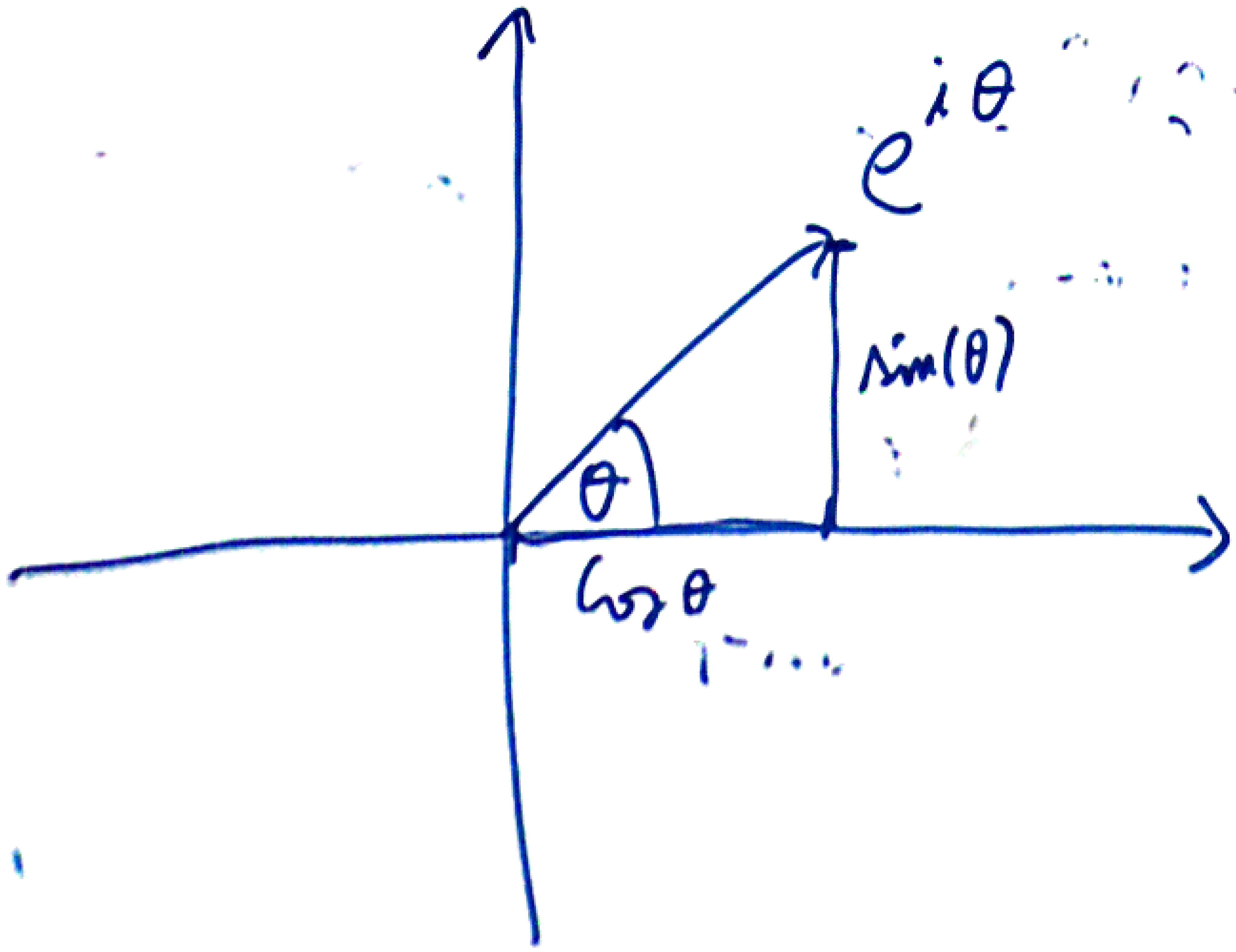
$\left(e^{\frac{2\pi i}{5}}\right)^{5}$

$(\omega_5)^5 = 1$ $(\omega_5^2)^5$

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

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

$X^5 - 1$



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

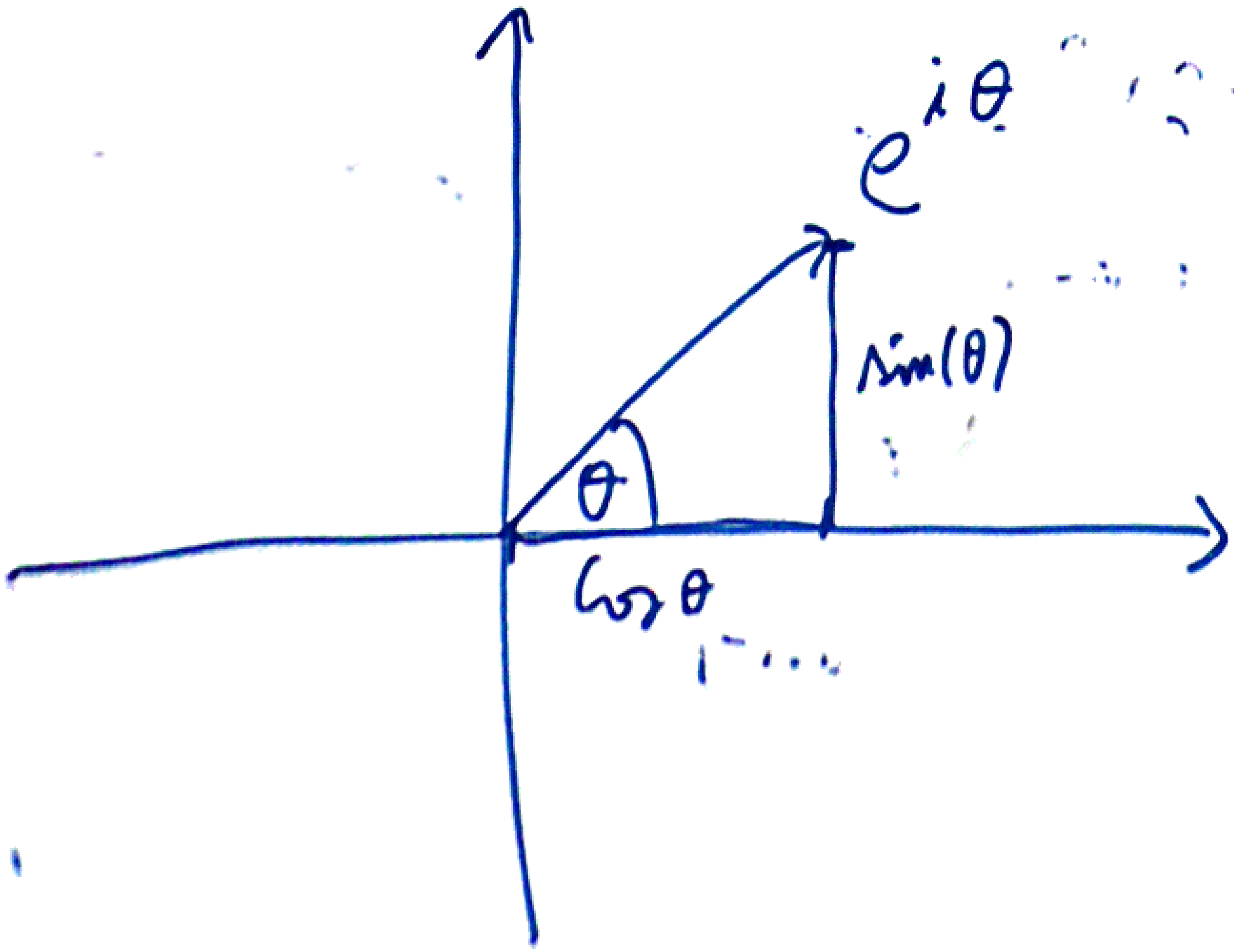
$\left(e^{\frac{2\pi i}{5}}\right)^5$

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

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

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

$X^5 - 1$



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

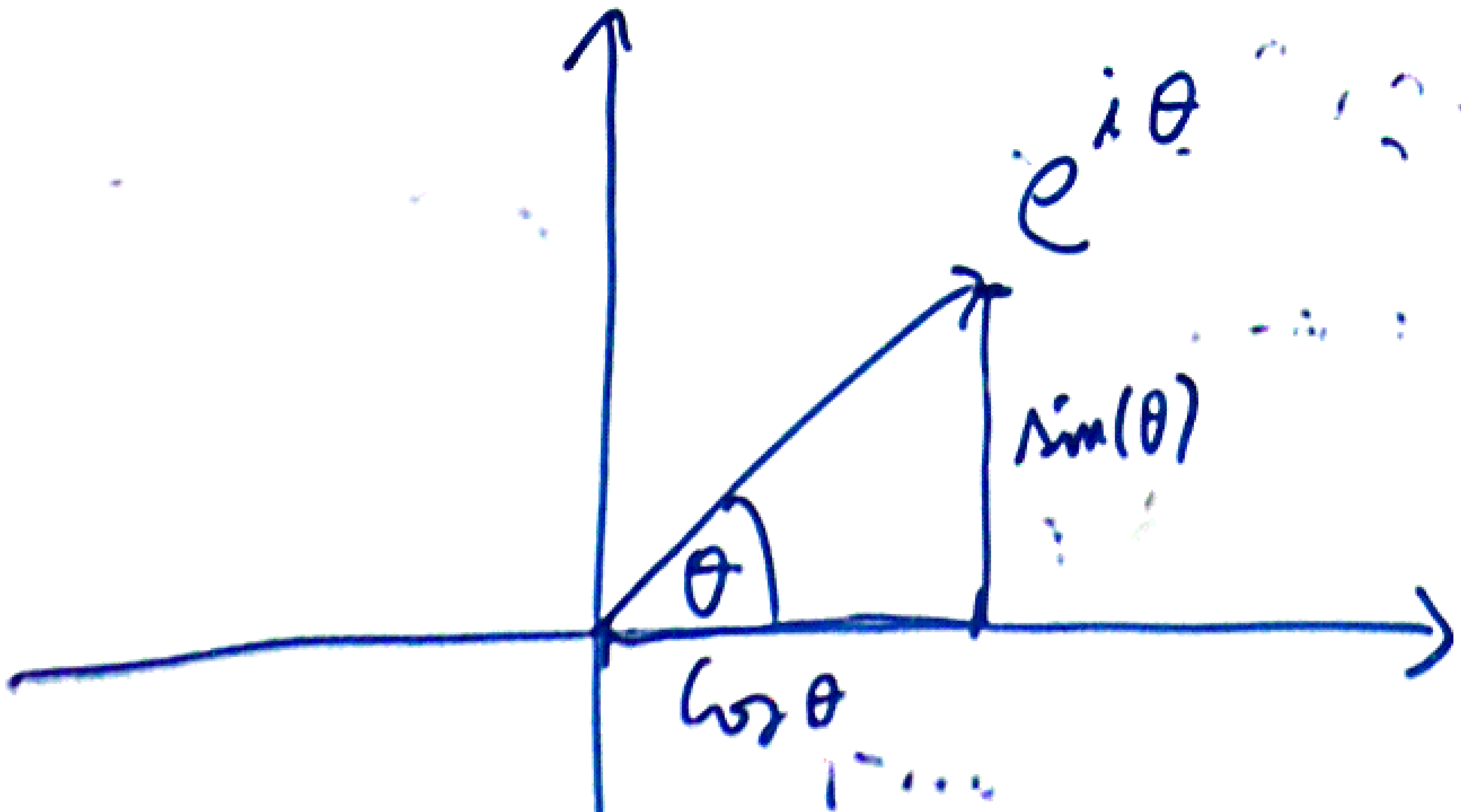
$\left(e^{\frac{2\pi i}{5}}\right)^5$

$(w_5)^5 = 1$, $(w_5^2)^5$

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

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

$X^5 - 1$



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

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

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

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