

$$M = \langle u, v \mid u^2 = v^8 = 1, vu = uv^5 \rangle \quad |M| = 16.$$

$$vu = uv^5$$

$$v^2u = v(vu) = vuv^5 = uv^5v^5 = uv^2$$

$$v^3u = v^2v^2u = vuv^2 = uv^5v^2 = uv^7$$

$$v^4u = vuv^7 = uv^5v^7 = uv^4$$

$$v^5u = vuv^4 = uv^5v^4 = uv$$

$$v^6u = uv^6$$

$$v^7u = vuv^6 = uv^5v^6 = uv^3$$

looks like $v^2 \in Z(6)$, $\Rightarrow v^4, v^6 \in Z(6)$

$$\langle vu \rangle = \{vu, v^6, v^7u, v^4, v^5u, v^2, v^3u, e\}$$

$$= \langle v^7u \rangle = \langle v^5u \rangle = \langle v^3u \rangle$$

$$(vu)^2 = vuvu = vuuv^5 = v^6$$

$$(vu)^3 = vu v^6 = v^7u$$

$$(vu)^4 = (vu)v^7u = vuuv^3 = v^4$$

$$(vu)^5 = vu v^4 = v^5u$$

$$(vu)^6 = vu v^5u = vuuv = v^2$$

$$(vu)^7 = vu v^2 = v^3u$$

$$(vu)^8 = vu v^3u = vuuv^7 = v^8 = e$$

← this has to be 1

$$\langle v^2u \rangle = \{v^2u, v^4u, v^6u, e\} = \langle v^6u \rangle$$

$$\langle v^4u \rangle = \{v^4u, e\}$$

$$\langle v \rangle = \{v, v^2, v^3, v^4, v^5, v^6, v^7, e\} = \langle v^3 \rangle$$

$$\langle v^5 \rangle$$

$$\langle v^7 \rangle$$

$$\langle u \rangle = \{u, e\}$$

$$\langle v^2 \rangle = \{v^2, v^4, v^6, e\} = \langle v^6 \rangle$$

$$\langle v^4 \rangle = \{v^4, e\}$$

all cyclic groups.

$$\langle u, v \rangle = G$$

$$\langle u, v \rangle$$

this is it!

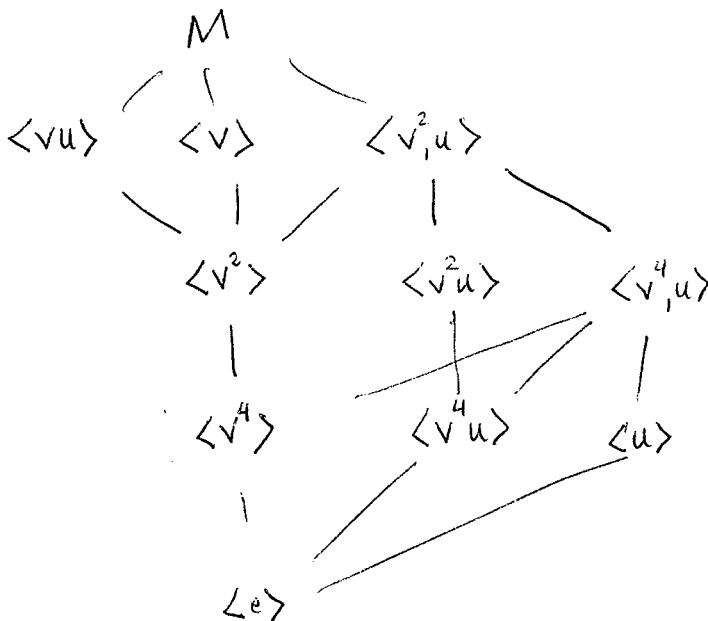
$$\langle v^2, u \rangle = \langle v^2u, u \rangle$$

$$= \{v^2, v^4, v^6, e, v^2u, v^4u, v^6u, u\}$$

not cyclic

$$= \langle v^6u \rangle$$

$$= \langle v^4u, u \rangle$$



I should switch these two

