

$$d = 12$$

$$\Psi_{\mathbb{Q}}(12) \supseteq \left\{ \begin{array}{l} (4), (6), (7), (8), (9), (10), (12), (13), (14), (15), (18), (20), (21), (24), (26), (28), (30), (36), (37), (42), \\ (2, 4), (2, 6), (2, 10), (2, 12), (2, 14), (2, 18), (2, 28), (2, 30), (2, 42), (3, 3), (3, 6), (3, 9), (3, 12), (3, 15), (3, 21), (4, 4), (4, 12), (5, 10), (6, 6), (6, 12) \end{array} \right\}$$

$G$	$\Psi_{\mathbb{Q}}(12, G) \setminus \{G\} \supseteq$
$()$	$\left\{ \begin{array}{l} (4), (6), (7), (8), (9), (10), (12), (13), (15), (21), (26), (30), (37), (2, 4), (2, 6), \\ (2, 10), (2, 14), (2, 18), (2, 28), (2, 30), (3, 3), (3, 6), (3, 9), (3, 15), (4, 4), (4, 12), (5, 10), (6, 6) \end{array} \right\}$
$(2)$	$\{(12), (14), (18), (24), (28), (36), (42), (2, 6), (2, 12), (2, 14), (2, 18), (2, 28), (2, 42), (3, 6), (3, 12), (6, 6), (6, 12)\}$
$(3)$	$\{(12), (21), (24), (30), (2, 12), (2, 30), (3, 15), (3, 21), (4, 12), (6, 6)\}$
$(4)$	$\{(24), (2, 12), (3, 12), (6, 12)\}$
$(5)$	$\{(20), (2, 30), (3, 15), (5, 10)\}$
$(6)$	$\{(36), (42), (2, 18), (2, 42), (3, 12), (6, 6), (6, 12)\}$
$(7)$	$\{(28)\}$
$(8)$	$\{\}$
$(9)$	$\{(36)\}$
$(10)$	$\{\}$
$(12)$	$\{(6, 12)\}$
$(2, 2)$	$\{(2, 12), (6, 6), (6, 12)\}$
$(2, 4)$	$\{\}$
$(2, 6)$	$\{(6, 12)\}$
$(2, 8)$	$\{\}$

$$g_{\mathbb{Q}}(12) \geq 6 \quad \#\mathcal{G}_{\mathbb{Q}}(12) \geq 134 \quad M_{\mathbb{Q}}(12) \geq 18176$$

$G$	$\mathcal{H}_{\mathbb{Q}}(12, E)$	Label
()	(2, 4)	196b2
()	(2, 28)	1922c1
()	(4)	26b2
()	(4, 4)	338a1
()	(4, 12)	162a2
()	(8)	338b1
()	(12)	486a1
()	(2, 4), (3, 3)	196a1
()	(3, 3), (4, 12)	1296j1
()	(4), (2, 6)	19a2
()	(4), (2, 10)	75a2
()	(4), (2, 14)	208d1
()	(4), (2, 18)	54a2
()	(4), (3, 3)	484a1
()	(4), (3, 9)	1728e3
()	(4), (6, 6)	300a1
()	(4), (7)	361a1
()	(4), (10)	11a2
()	(4), (13)	147b2
()	(4), (21)	27a2
()	(4), (26)	2890d1
()	(4), (37)	1225e1
()	(8), (3, 3)	1296h1
()	(8), (4, 12)	162d2
()	(12), (21)	108a2
()	(4), (2, 6), (3, 3)	176c1
()	(4), (2, 6), (3, 9)	1734j1
()	(4), (2, 10), (5, 10)	275b2
()	(4), (2, 18), (3, 9)	432e3
()	(4), (6), (2, 6)	6627e1
()	(4), (6) <sup>2</sup>	1210d1
()	(4), (7), (6, 6)	1728f1
()	(4), (7), (21)	441b2
()	(4), (9), (3, 3)	361b1
()	(4), (10), (2, 10)	99d2
()	(4), (10), (3, 3)	1600v1
()	(4), (10) <sup>2</sup>	18176b2

$G$	$\mathcal{H}_{\mathbb{Q}}(12, E)$	Label
()	(4), (21), (2, 6)	162b4
()	(4), (21), (3, 3)	5184u3
()	(7), (12), (6, 6)	432b1
()	(8), (3, 3), (4, 12)	1296h2
()	(4), (2, 6) <sup>2</sup> , (3, 6)	175b2
()	(4), (6) <sup>2</sup> , (10)	338d1
()	(4), (6), (9), (2, 6)	121b1
()	(4), (7), (2, 6), (3, 3)	225a1
()	(4), (7), (9), (6, 6)	675a1
()	(4), (9), (2, 6), (3, 3)	175b1
()	(4), (10), (2, 6), (3, 3)	400b3
()	(4), (10), (15), (2, 6)	50a2
()	(4), (15), (2, 30), (3, 3)	1600q1
()	(4), (21), (2, 6), (3, 3)	1296e2
()	(4), (30), (2, 6), (3, 3)	50b3
()	(7), (9), (12), (6, 6)	432a1
()	(7), (12), (2, 6), (3, 3)	3600bd2
()	(4), (7) <sup>2</sup> , (2, 6), (3, 3)	441a1
()	(4), (7), (9), (2, 6), (3, 3)	432a2
()	(4), (7), (21), (2, 6), (3, 3)	441a2
()	(4), (10), (15), (2, 6), (3, 3)	50b4
()	(4), (30), (2, 6), (2, 10), (3, 15)	50a4
()	(7) <sup>2</sup> , (12), (2, 6), (3, 3)	7056bc2
()	(7), (9), (12), (2, 6), (3, 3)	432a4
()	(12) <sup>2</sup> , (2, 6), (3, 3), (4, 4)	4050g2
()	(4), (15), (30), (2, 6), (2, 10), (3, 3)	400b1
(2)	(2, 14)	441d1
(2)	(2, 28)	49a1
(2)	(6, 6)	80b1
(2)	(6, 12)	30a3
(2)	(12)	84a3
(2)	(18)	256a1
(2)	(28)	49a4
(2)	(2, 6), (3, 6)	80b2
(2)	(2, 12), (3, 12)	240b1
(2)	(2, 12), (6, 6)	1040g4
(2)	(2, 14), (6, 6)	144a3

$G$	$\mathcal{H}_{\mathbb{Q}}(12, E)$	Label
(2)	(2, 18), (6, 6)	98a1
(2)	(3, 12), (6, 6)	84a4
(2)	(12), (2, 42)	36a3
(2)	(12), (6, 6)	20a3
(2)	(14), (6, 6)	144a2
(2)	(28), (2, 14)	49a2
(2)	(28), (2, 28)	49a3
(2)	$(2, 12)^2$ , (6, 6)	960o4
(2)	$(2, 18)^2$ , (6, 6)	98a5
(2)	(12), (2, 6), (3, 6)	80b4
(2)	(12), (2, 6), (3, 12)	240b3
(2)	(12), (2, 12), (6, 6)	130a4
(2)	(12), (2, 14), (6, 6)	144a1
(2)	$(12)^2$ , (6, 6)	960o7
(2)	(14), (2, 6), (3, 6)	576a2
(2)	(24), (2, 12), (3, 12)	960o1
(2)	(42), (3, 12), (6, 6)	36a4
(2)	$(2, 12)$ , $(3, 12)^2$ , (6, 6)	30a7
(2)	$(12)$ , $(2, 18)^2$ , (6, 6)	14a3
(2)	$(12)^2$ , (2, 6), (3, 6)	150c4
(2)	(18), (2, 6), (2, 18), (3, 6)	112c1
(2)	$(2, 12)^2$ , $(3, 12)^2$ , (6, 6)	90c4
(2)	(12), (18), (2, 6), (2, 18), (3, 6)	98a6
(2)	(18), (36), (2, 6), (2, 18), (3, 6)	98a2
(2)	(24), (2, 12), $(3, 12)^2$ , (6, 6)	90c5
(3)	(2, 12)	196b1
(3)	(4, 12)	162a1
(3)	(12)	19a3
(3)	(24)	162d1
(3)	(12), (3, 21)	27a1
(3)	(12), (6, 6)	19a1
(3)	(12), (21)	27a4
(3)	(12), (30)	50a1
(3)	(12), (2, 30), (3, 15)	50a3
(3)	$(12)$ , $(21)^2$	441b1
(4)	(6, 12)	150c1
(4)	(2, 12), (3, 12)	720j5

$G$	$\mathcal{H}_{\mathbb{Q}}(12, E)$	Label
(4)	(24), (6, 12)	90c1
(4)	(24), (2, 12), (3, 12)	960o5
(5)	(20)	11a3
(5)	(20), (5, 10)	11a1
(5)	(20), (2, 30), (3, 15)	50b1
(6)	(2, 42)	36a1
(6)	(6, 6)	20a1
(6)	(6, 12)	30a1
(6)	(3, 12), (6, 6)	84a2
(6)	$(3, 12)^2$ , (6, 6)	30a4
(6)	(36), (2, 18), (6, 6)	14a4
(6)	(42), (3, 12), (6, 6)	36a2
(7)	(28)	26b1
(9)	(36)	54b3
(12)	(6, 12)	90c3
(2, 2)	(6, 6)	240b6
(2, 2)	(6, 12)	960o2
(2, 2)	(2, 12), (6, 6)	150c6
(2, 2)	$(2, 12)^3$	210a6
(2, 2)	$(2, 12)^2$ , (6, 6)	720j2
(2, 2)	$(2, 12)^2$ , (6, 12)	30a6
(2, 2)	$(2, 12)^3$ , (6, 6)	150c2
(2, 6)	(6, 12)	30a2