

Classify groups of each of the following orders. For each order, the factorization into prime powers is given, followed in parentheses by the number of non-isomorphic groups of that order. In the following lines, the numeric “Sylow” information is shown. I have left out orders that are beyond our reach using the methods taught in class.

$$2 = 2 \quad (1) \\ 2 \mid 1$$

$$3 = 3 \quad (1) \\ 3 \mid 1$$

$$4 = 2^2 \quad (2) \\ 2 \mid 1$$

$$5 = 5 \quad (1) \\ 5 \mid 1$$

$$6 = 2 * 3 \quad (2) \\ 2 \mid 1 \quad 3 \\ 3 \mid 1$$

$$7 = 7 \quad (1) \\ 7 \mid 1$$

$$9 = 3^2 \quad (2) \\ 3 \mid 1$$

$$10 = 2 * 5 \quad (2) \\ 2 \mid 1 \quad 5 \\ 5 \mid 1$$

$$11 = 11 \quad (1) \\ 11 \mid 1$$

$$12 = 2^2 * 3 \quad (5) \\ 2 \mid 1 \quad 3 \\ 3 \mid 1 \quad 4$$

$$13 = 13 \quad (1) \\ 13 \mid 1$$

$$14 = 2 * 7 \quad (2) \\ 2 \mid 1 \quad 7 \\ 7 \mid 1$$

$$15 = 3 * 5 \quad (1) \\ 3 \mid 1 \\ 5 \mid 1$$

$$17 = 17 \quad (1)$$

$$17 \mid 1$$

$$18 = 2 * 3^2 \quad (5)$$

$$2 \mid 1 \quad 3 \quad 9$$

$$3 \mid 1$$

$$19 = 19 \quad (1)$$

$$19 \mid 1$$

$$20 = 2^2 * 5 \quad (5)$$

$$2 \mid 1 \quad 5$$

$$5 \mid 1$$

$$21 = 3 * 7 \quad (2)$$

$$3 \mid 1 \quad 7$$

$$7 \mid 1$$

$$22 = 2 * 11 \quad (2)$$

$$2 \mid 1 \quad 11$$

$$11 \mid 1$$

$$23 = 23 \quad (1)$$

$$23 \mid 1$$

$$25 = 5^2 \quad (2)$$

$$5 \mid 1$$

$$26 = 2 * 13 \quad (2)$$

$$2 \mid 1 \quad 13$$

$$13 \mid 1$$

$$28 = 2^2 * 7 \quad (4)$$

$$2 \mid 1 \quad 7$$

$$7 \mid 1$$

$$29 = 29 \quad (1)$$

$$29 \mid 1$$

$$30 = 2 * 3 * 5 \quad (4)$$

$$2 \mid 1 \quad 3 \quad 5 \quad 15$$

$$3 \mid 1 \quad 10$$

$$5 \mid 1 \quad 6$$

$$31 = 31 \quad (1)$$

$$31 \mid 1$$

$$33 = 3 * 11 \quad (1)$$

$$\begin{array}{c} 3 \mid 1 \\ 11 \mid 1 \end{array}$$

$$34 = 2 * 17 \quad (2)$$

$$\begin{array}{c} 2 \mid 1 \ 17 \\ 17 \mid 1 \end{array}$$

$$35 = 5 * 7 \quad (1)$$

$$\begin{array}{c} 5 \mid 1 \\ 7 \mid 1 \end{array}$$

$$37 = 37 \quad (1)$$

$$37 \mid 1$$

$$38 = 2 * 19 \quad (2)$$

$$\begin{array}{c} 2 \mid 1 \ 19 \\ 19 \mid 1 \end{array}$$

$$39 = 3 * 13 \quad (2)$$

$$\begin{array}{c} 3 \mid 1 \ 13 \\ 13 \mid 1 \end{array}$$

$$41 = 41 \quad (1)$$

$$41 \mid 1$$

$$42 = 2 * 3 * 7 \quad (6)$$

$$\begin{array}{c} 2 \mid 1 \ 3 \ 7 \ 21 \\ 3 \mid 1 \ 7 \\ 7 \mid 1 \end{array}$$

$$43 = 43 \quad (1)$$

$$43 \mid 1$$

$$44 = 2^2 * 11 \quad (4)$$

$$\begin{array}{c} 2 \mid 1 \ 11 \\ 11 \mid 1 \end{array}$$

$$45 = 3^2 * 5 \quad (2)$$

$$\begin{array}{c} 3 \mid 1 \\ 5 \mid 1 \end{array}$$

$$46 = 2 * 23 \quad (2)$$

$$\begin{array}{c} 2 \mid 1 \ 23 \\ 23 \mid 1 \end{array}$$

$$47 = 47 \quad (1)$$

$$47 \mid 1$$

$$49 = 7^2 \quad (2)$$

$$\begin{array}{c} 7 \\ | \\ 1 \end{array}$$

$$50 = 2 * 5^2 \quad (5)$$

$$\begin{array}{c} 2 \\ | \\ 5 \end{array} \begin{array}{c} 1 \\ 5 \\ 25 \end{array}$$

$$51 = 3 * 17 \quad (1)$$

$$\begin{array}{c} 3 \\ | \\ 17 \end{array} \begin{array}{c} 1 \\ 1 \end{array}$$

$$52 = 2^2 * 13 \quad (5)$$

$$\begin{array}{c} 2 \\ | \\ 13 \end{array} \begin{array}{c} 1 \\ 13 \end{array}$$

$$53 = 53 \quad (1)$$

$$\begin{array}{c} 53 \\ | \\ 1 \end{array}$$

$$55 = 5 * 11 \quad (2)$$

$$\begin{array}{c} 5 \\ | \\ 11 \end{array} \begin{array}{c} 1 \\ 11 \end{array}$$

$$57 = 3 * 19 \quad (2)$$

$$\begin{array}{c} 3 \\ | \\ 19 \end{array} \begin{array}{c} 1 \\ 19 \end{array}$$

$$58 = 2 * 29 \quad (2)$$

$$\begin{array}{c} 2 \\ | \\ 29 \end{array} \begin{array}{c} 1 \\ 29 \end{array}$$

$$59 = 59 \quad (1)$$

$$\begin{array}{c} 59 \\ | \\ 1 \end{array}$$

$$61 = 61 \quad (1)$$

$$\begin{array}{c} 61 \\ | \\ 1 \end{array}$$

$$62 = 2 * 31 \quad (2)$$

$$\begin{array}{c} 2 \\ | \\ 31 \end{array} \begin{array}{c} 1 \\ 31 \end{array}$$

$$63 = 3^2 * 7 \quad (4)$$

$$\begin{array}{c} 3 \\ | \\ 7 \end{array} \begin{array}{c} 1 \\ 7 \end{array}$$

$$65 = 5 * 13 \quad (1)$$

$$\begin{array}{c} 5 \\ | \\ 13 \end{array} \begin{array}{c} 1 \\ 13 \end{array}$$

$$\begin{array}{l}
 66 = 2 * 3 * 11 \quad (4) \\
 2 \mid 1 \ 3 \ 11 \ 33 \\
 3 \mid 1 \ 22 \\
 11 \mid 1
 \end{array}$$

$$\begin{array}{l}
 67 = 67 \quad (1) \\
 67 \mid 1
 \end{array}$$

$$\begin{array}{l}
 68 = 2^2 * 17 \quad (5) \\
 2 \mid 1 \ 17 \\
 17 \mid 1
 \end{array}$$

$$\begin{array}{l}
 69 = 3 * 23 \quad (1) \\
 3 \mid 1 \\
 23 \mid 1
 \end{array}$$

$$\begin{array}{l}
 70 = 2 * 5 * 7 \quad (4) \\
 2 \mid 1 \ 5 \ 7 \ 35 \\
 5 \mid 1 \\
 7 \mid 1
 \end{array}$$

$$\begin{array}{l}
 71 = 71 \quad (1) \\
 71 \mid 1
 \end{array}$$

$$\begin{array}{l}
 73 = 73 \quad (1) \\
 73 \mid 1
 \end{array}$$

$$\begin{array}{l}
 74 = 2 * 37 \quad (2) \\
 2 \mid 1 \ 37 \\
 37 \mid 1
 \end{array}$$

$$\begin{array}{l}
 76 = 2^2 * 19 \quad (4) \\
 2 \mid 1 \ 19 \\
 19 \mid 1
 \end{array}$$

$$\begin{array}{l}
 77 = 7 * 11 \quad (1) \\
 7 \mid 1 \\
 11 \mid 1
 \end{array}$$

$$\begin{array}{l}
 78 = 2 * 3 * 13 \quad (6) \\
 2 \mid 1 \ 3 \ 13 \ 39 \\
 3 \mid 1 \ 13 \\
 13 \mid 1
 \end{array}$$

$$\begin{array}{l}
 79 = 79 \quad (1) \\
 79 \mid 1
 \end{array}$$

$$82 = 2 * 41 \quad (2)$$

$$\begin{array}{r|l} 2 & 1 \ 41 \\ 41 & 1 \end{array}$$

$$83 = 83 \quad (1)$$

$$\begin{array}{r|l} 83 & 1 \end{array}$$

$$85 = 5 * 17 \quad (1)$$

$$\begin{array}{r|l} 5 & 1 \\ 17 & 1 \end{array}$$

$$86 = 2 * 43 \quad (2)$$

$$\begin{array}{r|l} 2 & 1 \ 43 \\ 43 & 1 \end{array}$$

$$87 = 3 * 29 \quad (1)$$

$$\begin{array}{r|l} 3 & 1 \\ 29 & 1 \end{array}$$

$$89 = 89 \quad (1)$$

$$\begin{array}{r|l} 89 & 1 \end{array}$$

$$91 = 7 * 13 \quad (1)$$

$$\begin{array}{r|l} 7 & 1 \\ 13 & 1 \end{array}$$

$$92 = 2^2 * 23 \quad (4)$$

$$\begin{array}{r|l} 2 & 1 \ 23 \\ 23 & 1 \end{array}$$

$$93 = 3 * 31 \quad (2)$$

$$\begin{array}{r|l} 3 & 1 \ 31 \\ 31 & 1 \end{array}$$

$$94 = 2 * 47 \quad (2)$$

$$\begin{array}{r|l} 2 & 1 \ 47 \\ 47 & 1 \end{array}$$

$$95 = 5 * 19 \quad (1)$$

$$\begin{array}{r|l} 5 & 1 \\ 19 & 1 \end{array}$$

$$97 = 97 \quad (1)$$

$$\begin{array}{r|l} 97 & 1 \end{array}$$

$$98 = 2 * 7^2 \quad (5)$$

2	1	7	49
7	1		

$$99 = 3^2 * 11 \quad (2)$$

3	1	
11	1	