

### 2023 4-dice puzzle

Use the digits 2, 0, 2, 3 (in order) to make the numbers from 0 to 100. You may use

- Standard operations:  $+$ ,  $-$ ,  $\times$ ,  $\div$
- Negation:  $-\square$
- Exponentiation of two numbers:  $\square^\square$
- Square root of a number:  $\sqrt{\square}$
- $n$ th root of a number:  $\sqrt[n]{\square}$
- Factorial:  $\square!$  (Note: you may use iterated factorial but not multi-factorial, so that  $3!! = (3!)! = 6! = 720$ , and **not**  $3!! = 3 \times 1 = 3$ .)
- Digit decimal:  $.d$  (with an original digit; you cannot do  $.4! = .24$ )
- Digit repeating decimal:  $\overline{.d}$
- Percent:  $\square\%$

	33 =	67 =
0 =	34 =	68 =
1 =	35 =	69 =
2 =	36 =	70 =
3 =	37 =	71 =
4 =	38 =	72 =
5 =	39 =	73 =
6 =	40 =	74 =
7 =	41 =	75 =
8 =	42 =	76 =
9 =	43 =	77 =
10 =	44 =	78 =
11 =	45 =	79 =
12 =	46 =	80 =
13 =	47 =	81 =
14 =	48 =	82 =
15 =	49 =	83 =
16 =	50 =	84 =
17 =	51 =	85 =
18 =	52 =	86 =
19 =	53 =	87 =
20 =	54 =	88 =
21 =	55 =	89 =
22 =	56 =	90 =
23 =	57 =	91 =
24 =	58 =	92 =
25 =	59 =	93 =
26 =	60 =	94 =
27 =	61 =	95 =
28 =	62 =	96 =
29 =	63 =	97 =
30 =	64 =	98 =
31 =	65 =	99 =
32 =	66 =	100 =