

### The New Year Challenge Problem

**Solution:** We have

$$1 = 2 + 0! + 2 - 4$$

$$2 = 2 \times 0 - 2 + 4,$$

$$3 = 2^0 - 2 + 4,$$

$$4 = 2 + 0 - 2 + 4,$$

$$5 = 2 + 0! - 2 + 4,$$

$$6 = 2 \times 0 + 2 + 4,$$

$$7 = 2^0 + 2 + 4,$$

$$8 = 2 + 0 + 2 + 4,$$

$$9 = 2 + 0! + 2 + 4$$

$$10 = (2 + 0!) \times 2 + 4,$$

$$11 = 2 + 0! + 2 \times 4,$$

$$12 = (2^0 + 2) \times 4,$$

$$13 = (2 + 0!)^2 + 4,$$

$$14 = 2 + (0! + 2) \times 4,$$

$$15 = -2 + 0! + 2^4,$$

$$16 = (2 + 0 + 2) \times 4,$$

$$17 = 2^0 + 2^4,$$

$$18 = 2 + 0 + 2^4,$$

$$19 = 2 + 0! + 2^4,$$

$$20 = (2 + 0! + 2) \times 4,$$

$$21 = 20 - [\sqrt{2}] + \sqrt{4}$$

$$22 = 20 - 2 + 4,$$

$$23 = 20 - [\sqrt{2}] + 4$$

$$24 = (2 + 0!) \times 2 \times 4,$$

$$25 = 20 + [\sqrt{2}] + 4,$$

$$26 = 20 + 2 + 4,$$

$$27 = 2^0 + 2 + 4!,$$

$$28 = 20 + 2 \times 4.$$

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