

# 「フォア・フォーズの素数」(竹本健治)に出てくる計算例

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## 4つの4で表すことのできる値

$4 + 4 - 4 - 4 = 0$	$4! + 4 \div (\sqrt{4} + \sqrt{4}) = 25$	$4! + 4! + 4 - 4 = 48$
$(4 + 4) \div (4 + 4) = 1$	$4! + 4 - 4 + \sqrt{4} = 26$	$4! + 4! + 4 \div 4 = 49$
$4 \div 4 + 4 \div 4 = 2$	$4! + 4 - 4 \div 4 = 27$	
$(4 + 4 + 4) \div 4 = 3$	$4 \times (4 + 4) - 4 = 28$	$4! + 4! + 4 \div \sqrt{4} = 50$
$4 + 4 \times (4 - 4) = 4$	$4! + 4 + 4 \div 4 = 29$	$4! + 4! + \sqrt{\sum_{n=\sqrt{4}}^4 n} = 51$
$(4 \times 4 + 4) \div 4 = 5$		$4! + 4! + \sqrt{4} + \sqrt{4} = 52$
$4 + (4 + 4) \div 4 = 6$	$4! + 4 + 4 - \sqrt{4} = 30$	$44 + \sum_{n=\sqrt{4}}^4 n = 53$
$4 + 4 - 4 \div 4 = 7$	$4! + (4! + 4) \div 4 = 31$	$4! + 4! + 4 + \sqrt{4} = 54$
$4 + 4 + 4 - 4 = 8$	$4 \times 4 + 4 \times 4 = 32$	$44 \div 4 C_{\sqrt{4}} = 55$
$4 + 4 + 4 \div 4 = 9$	$4! \div \sqrt{4} C_{\sqrt{4}} \div \sqrt{4} = 33$	$4! + 4! + 4 + 4 = 56$
	$4 \times (4 + 4) + \sqrt{4} = 34$	$4! + 4! + \sum_{n=\sqrt{4}}^4 n = 57$
$(44 - 4) \div 4 = 10$	$44 \div 4 + 4! = 35$	$(4^4 - 4!) \div 4 = 58$
$44 \div (\sqrt{4} + \sqrt{4}) = 11$	$4 \times (4 + 4) + 4 = 36$	$4! + \sum_{n=\sqrt{4}}^{4+4} n = 59$
$4 \times (4 - 4 \div 4) = 12$	$4! + (4! + \sqrt{4}) \div \sqrt{4} = 37$	
$44 \div 4 + \sqrt{4} = 13$	$44 - 4 - \sqrt{4} = 38$	$4 \times 4 \times 4 - 4 = 60$
$4 \times 4 - 4 \div \sqrt{4} = 14$	$4! + {}_{4+\sqrt{4}}C_{\sqrt{4}} = 39$	$\left( \sum_{n=\sqrt{4}}^4 (4! - n) \right) - \sqrt{4} = 61$
$4 \times 4 - 4 \div 4 = 15$		$4 \times 4 \times 4 - \sqrt{4} = 62$
$4 \times 4 + 4 - 4 = 16$	$44 - \sqrt{4} - \sqrt{4} = 40$	$(4^4 - 4) \div 4 = 63$
$4 \times 4 + 4 \div 4 = 17$	$44 - \sqrt{\sum_{n=\sqrt{4}}^4 n} = 41$	$44 + 4! - 4 = 64$
$4 \times 4 + 4 \div \sqrt{4} = 18$	$44 - 4 + \sqrt{4} = 42$	${}_{4!}C_{\sqrt{4}} \div 4 - 4 = 65$
$4! - 4 - 4 \div 4 = 19$	$44 - 4 \div 4 = 43$	$4 \times 4 \times 4 + \sqrt{4} = 66$
	$44 + 4 - 4 = 44$	${}_{4!}C_{\sqrt{4}} \div 4 - \sqrt{4} = 67$
$4 \times (4 + 4 \div 4) = 20$	$44 + 4 \div 4 = 45$	$4 \times 4 \times 4 + 4 = 68$
$4! - 4 + 4 \div 4 = 21$	$44 + 4 - \sqrt{4} = 46$	${}_{4!}C_{\sqrt{4}} \div (\sqrt{4} + \sqrt{4}) = 69$
$4! + 4 - 4 - \sqrt{4} = 22$	$4! + 4! - 4 \div 4 = 47$	
$4! - 4 \div (\sqrt{4} + \sqrt{4}) = 23$		
$4 \times 4 + 4 + 4 = 24$		

\*pn675 の Web ページ (<http://pn675.html.xdomain.jp/>)

$$4! + 4! + 4! - \sqrt{4} = 70$$

$${}_{4!}C_{\sqrt{4}} \div 4 + \sqrt{4} = 71$$

$$44 + 4! + 4 = 72$$

$${}_{4!}C_{\sqrt{4}} \div 4 + 4 = 73$$

$$4! + 4! + 4! + \sqrt{4} = 74$$

$$({}_{4!}C_{\sqrt{4}} + 4!) \div 4 = 75$$

$$4! + 4! + 4! + 4 = 76$$

$$\left( \sum_{n=\sqrt{4}}^4 n \right)^{\sqrt{4}} - 4 = 77$$

$$(4! - 4) \times 4 - \sqrt{4} = 78$$

$$\left( \sum_{n=\sqrt{4}}^4 n \right)^{\sqrt{4}} - \sqrt{4} = 79$$

$$4! \times 4 - 4 \times 4 = 80$$

$$(4 - 4 \div 4)^4 = 81$$

$$(4! - 4) \times 4 + \sqrt{4} = 82$$

$$\left( \sum_{n=\sqrt{4}}^4 n \right)^{\sqrt{4}} + \sqrt{4} = 83$$

$$44 \times \sqrt{4} - 4 = 84$$

$$\left( \sum_{n=\sqrt{4}}^4 n \right)^{\sqrt{4}} + 4 = 85$$

$$44 \times \sqrt{4} - \sqrt{4} = 86$$

$$4! \times 4 - \sum_{n=\sqrt{4}}^4 n = 87$$

$$44 + 44 = 88$$

(89 は作中に無し)

$$4! \times 4 - 4 - \sqrt{4} = 90$$

$${}_{4 \times 4 - \sqrt{4}}C_{\sqrt{4}} = 91$$

$$4! \times 4 - \sqrt{4} - \sqrt{4} = 92$$

$${}_{4!}C_{\sqrt{4}} \div 4 + 4! = 93$$

$$4! \times 4 - 4 + \sqrt{4} = 94$$

$$4! \times 4 - 4 \div 4 = 95$$

$$4! \times 4 + 4 - 4 = 96$$

$$4! \times 4 + 4 \div 4 = 97$$

$$4! \times 4 + 4 - \sqrt{4} = 98$$

$$4! \times 4 + \sqrt{\sum_{n=\sqrt{4}}^4 n} = 99$$

$$4! \times 4 + \sqrt{4} + \sqrt{4} = 100$$

### 1つの4で表すことのできる値

$$\sqrt{4} = 2$$

$$4 = 4$$

$$4! = 24$$

### 2つの4で表すことのできる値

$$4 - 4 = 0$$

$$4 \div 4 = 1$$

$$\sqrt{\sum_{n=\sqrt{4}}^4 n} = 3$$

$$4 + \sqrt{4} = 6$$

$${}_{4}C_{\sqrt{4}} = 6$$

$$4 + 4 = 8$$

$$\sum_{n=\sqrt{4}}^4 n = 9$$

$$4! \div \sqrt{4} = 12$$

$$4 \times 4 = 16$$

$$4! - 4 = 20$$

$$4! - \sqrt{4} = 22$$

$$4! + \sqrt{4} = 26$$

$$4! + 4 = 28$$

$$\sum_{n=\sqrt{4}}^4 (n!) = 32$$

$$44 = 44$$

$$4! + 4! = 48$$

$$\sqrt{\sqrt{\sqrt{4!}}} = 64$$

$$4! \times 4 = 96$$

$$4^4 = 256$$

$${}_{4!}C_{\sqrt{4}} = 276$$

$$\sum_{n=4}^{4!} n = 294$$

$$\sum_{n=\sqrt{4}}^{4!} n = 294$$

$${}_{4!}P_{\sqrt{4}} = 552$$

$$4! \times 4! = 552$$

$$(4 + \sqrt{4})! = 720$$

### 3つの4で表すことのできる値

$4 - 4 \div 4 = 3$	$4! + 4! + 4 = 52$	$4!C_{\sqrt{4}} \div \sqrt{4} = 138$
$4 + 4 \div 4 = 5$	$(4! + 4) \times \sqrt{4} = 56$	$4! \times 4! \div 4 = 144$
$(4! + 4) \div 4 = 7$	$\sqrt{\sqrt{\sqrt{4^{4!}}}} - 4 = 60$	$44 \times 4 = 176$
$4 + 4 + \sqrt{4} = 10$	$\sqrt{\sqrt{\sqrt{4^{4!}}}} - \sqrt{4} = 62$	$4! - 4C_{\sqrt{4}} = 190$
$44 \div 4 = 11$	$\sum_{n=\sqrt{4}}^4 (4! - n) = 63$	$4! \times 4 \times \sqrt{4} = 192$
$(4! + \sqrt{4}) \div \sqrt{4} = 13$	$4 \times 4 \times 4 = 64$	$4! - \sqrt{4}C_{\sqrt{4}} = 231$
$(4! + 4) \div \sqrt{4} = 14$	$4! \div \sqrt{4}C_{\sqrt{4}} = 66$	$4^4 - 4! = 232$
$4 + \sqrt{4}C_{\sqrt{4}} = 15$	$44 + 4! = 68$	$4 \times 4P_{\sqrt{4}} = 240$
$4 \times 4 + \sqrt{4} = 18$	$4!C_{\sqrt{4}} \div 4 = 69$	$4^4 - 4 = 252$
$4! - \sqrt{\sum_{n=\sqrt{4}}^4 n} = 21$	$4 + 4C_4 = 70$	$4^4 - \sqrt{4} = 254$
$4! - 4 \div 4 = 23$	$4! + 4! + 4! = 72$	$4^4 + \sqrt{4} = 258$
$4! + 4 \div 4 = 25$	$4! + \sqrt{4} \sum_{n=4!} n = 75$	$4^4 + 4 = 260$
$4! + \sqrt{\sum_{n=\sqrt{4}}^4 n} = 27$	$4! \div \sqrt{4} \sum_{n=\sqrt{4}} n = 77$	$4!C_{\sqrt{4}} - 4 = 272$
$\sum_{n=\sqrt{4}}^4 (n^{\sqrt{4}}) = 29$	$(4! - 4) \times 4 = 80$	$4!C_{\sqrt{4}} - \sqrt{4} = 274$
$(4 + \sqrt{4})! \div 4! = 30$	$\left(\sum_{n=\sqrt{4}}^4 n\right)^{\sqrt{4}} = 81$	$4!C_{\sqrt{4}} + \sqrt{4} = 278$
$4 \times 4 \times \sqrt{4} = 32$	$44 \times \sqrt{4} = 88$	$4^4 + 4! = 280$
$4! + \sum_{n=\sqrt{4}}^4 n = 33$	$4! \times 4 - 4 = 92$	$4! \times 4! \div \sqrt{4} = 288$
$\left(\sum_{n=\sqrt{4}}^4 (n!)\right) + \sqrt{4} = 34$	$4! \times 4 - \sqrt{4} = 94$	$4!C_{\sqrt{4}} + 4! = 300$
$\sum_{n=\sqrt{4}}^{4+4} n = 35$	$4! \times 4 + \sqrt{4} = 98$	$4! + \sqrt{4}C_{\sqrt{4}} = 325$
$(4 + \sqrt{4})^{\sqrt{4}} = 36$	$4! \times 4 + 4 = 100$	$(4 + \sqrt{4})! \div \sqrt{4} = 360$
$44 - 4 = 4$	$(4! + \sqrt{4}) \times 4 = 112$	$4! + 4C_{\sqrt{4}} = 378$
$44 - \sqrt{4} = 42$	$4! \times 4 + 4! = 120$	$4! - 4P_{\sqrt{4}} = 380$
$44 + \sqrt{4} = 56$	$4^4 \div \sqrt{4} = 128$	$4! \times 4 \times 4 = 384$
$4! + 4! + \sqrt{4} = 50$	$4! \div \sqrt{4}P_{\sqrt{4}} = 132$	$(4! - 4)^{\sqrt{4}} = 400$
		$444 = 444$
		$4! \times (4! - 4) = 480$
		$(4! - \sqrt{4})^{\sqrt{4}} = 484$
		$4! \div \sqrt{4}C_4 = 495$

## その他の数式

$$4! \div .4 - 4 \div 4 = 59 \quad (\text{但し、. は小数点. e.x. .4=0.4})$$

$$44 + 4 \div .4 = 53 \quad (\text{但し、上付き点 } \cdot \text{ は循環節.})$$

$$(\pi + \pi + \dots + \pi) / \pi + 4 + 4 - 4 - 4 = n \quad (\text{但し、} () \text{ の中の } \pi \text{ は } n \text{ 個.})$$

$$-\log_{\sqrt{4}} \log_{\sqrt{4}} \sqrt{\sqrt{\dots \sqrt{4 - \sqrt{4}}}} = n \quad (\text{但し、} \sqrt{\quad} \text{ は } n \text{ 重.})$$