

武田 利一 様

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新年度も始まりおいそがしい日々をおくら
れていると思います。お体に気をつけて下さ
い。

3月に西三サークルの勉強会で「中高の接
続」をテーマとされているオに出会うことが
できました。「地域連携型中高一貫教育」への
関心が深まりました。

私なりにテーマを考えてみました。「筆算に
よる割り算の原理と循環小数について ——
1÷23を例として」を1つ目にえらびまし
た。分数と小数を考える上での基本となると
思、たからです。「絵」を6枚書きました。解
説はまだできていません。もうしわけありま
せん。

筆算による $1 \div 23$ の計算 (部分)

$1 \div 10 \div 10 \div 10 \div 10 \div 10 \div 10 \div 10 \div 10$
 $\sim \sim \sim \sim \sim \sim \sim \sim$

| | | |
|------|-------------------|---------------------|
| | <u>0.04347826</u> | |
| | 23) 1 | |
| | - 0 | |
| | ① | $0 \times 23 = 0$ |
| x 10 | 10 | $1 \times 23 = 23$ |
| | - 0 | $2 \times 23 = 46$ |
| | ①0 | $3 \times 23 = 69$ |
| x 10 | 100 | $4 \times 23 = 92$ |
| | - 92 | $5 \times 23 = 115$ |
| | ⑧ | $6 \times 23 = 138$ |
| x 10 | 80 | $7 \times 23 = 161$ |
| | - 69 | $8 \times 23 = 184$ |
| | ①1 | $9 \times 23 = 207$ |
| x 10 | 110 | |
| | - 92 | |
| | ①8 | |
| x 10 | 180 | |
| | - 161 | |
| | ①9 | |
| x 10 | 190 | |
| | - 184 | |
| | ⑥ | |
| x 10 | 60 | |
| | - 46 | |
| | ①4 | |
| x 10 | 140 | |
| | - 138 | |
| | ② | |
| x 10 | 20 | |

N ÷ 23 の表 (部分)

2

10桁電卓を使用しました。

| | | 順番 |
|-----------|-------------|----|
| 1 ÷ 23 = | 0.043478260 | 0 |
| 2 ÷ 23 = | 0.086956521 | 8 |
| 3 ÷ 23 = | 0.130434782 | 20 |
| 4 ÷ 23 = | 0.173913043 | 16 |
| 5 ÷ 23 = | 0.217391304 | 15 |
| 6 ÷ 23 = | 0.260869565 | 6 |
| 7 ÷ 23 = | 0.304347826 | 21 |
| 8 ÷ 23 = | 0.347826086 | 2 |
| 9 ÷ 23 = | 0.391304347 | 18 |
| 10 ÷ 23 = | 0.434782608 | 1 |
| 11 ÷ 23 = | 0.478260869 | 3 |
| 12 ÷ 23 = | 0.521739130 | 14 |
| 13 ÷ 23 = | 0.565217391 | 12 |
| 14 ÷ 23 = | 0.608695652 | 7 |
| 15 ÷ 23 = | 0.652173913 | 13 |
| 16 ÷ 23 = | 0.695652173 | 10 |
| 17 ÷ 23 = | 0.739130434 | 17 |
| 18 ÷ 23 = | 0.782608695 | 4 |
| 19 ÷ 23 = | 0.826086956 | 5 |
| 20 ÷ 23 = | 0.869565217 | 9 |
| 21 ÷ 23 = | 0.913043478 | 19 |
| 22 ÷ 23 = | 0.956521739 | 11 |

$$1 \div 23 = 0.\overset{\cdot}{0}4347826086$$

$$9565217391\overset{\cdot}{3}$$

計算のと中のあまりの順番

(0) (1) (2) (3) (4) (5) (6)

1 10 8 11 18 19 6

(7) (8) (9) (10) (11) (12) (13)

14 2 20 16 22 13 15

(14) (15) (16) (17) (18) (19) (20)

12 5 4 17 9 21 3

(21) (22)

7 1

計算のと中のあまりの順番を使って

$$\textcircled{2} + \textcircled{8} = \textcircled{10}$$

$$8 \times 2 = 16$$

$$\textcircled{8} + \textcircled{8} = \textcircled{16}$$

$$2 \times 2 = 4$$

$$\textcircled{2} + \textcircled{6} = \textcircled{8}$$

$$8 \times 6 = 48 = 23 \times 2 + 2$$

$$\textcircled{3} + \textcircled{6} = \textcircled{9}$$

$$11 \times 6 = 66 = 23 \times 2 + 20$$

$$\textcircled{15} + \textcircled{16} = \textcircled{31} = 22 \times 1 + \textcircled{9}$$

$$5 \times 4 = 20$$

$$\textcircled{16} + \textcircled{20} = \textcircled{36} = 22 \times 1 + \textcircled{14}$$

$$4 \times 3 = 12$$

$$\textcircled{10} + \textcircled{10} = \textcircled{20}$$

$$16 \times 16 = 256 = 23 \times 11 + 3$$

| | | |
|---|--------------------------|-------------------|
| 0 | $1 = 0 \times 23 + 1$ | $\times 10 = 10$ |
| 0 | $10 = 0 \times 23 + 10$ | $\times 10 = 100$ |
| 4 | $100 = 4 \times 23 + 8$ | $\times 10 = 80$ |
| 3 | $80 = 3 \times 23 + 11$ | $\times 10 = 110$ |
| 4 | $110 = 4 \times 23 + 18$ | $\times 10 = 180$ |
| 7 | $180 = 7 \times 23 + 19$ | $\times 10 = 190$ |
| 8 | $190 = 8 \times 23 + 6$ | $\times 10 = 60$ |
| 2 | $60 = 2 \times 23 + 14$ | $\times 10 = 140$ |
| 6 | $140 = 6 \times 23 + 2$ | $\times 10 = 20$ |
| 0 | $20 = 0 \times 23 + 20$ | $\times 10 = 200$ |
| 8 | $200 = 8 \times 23 + 16$ | $\times 10 = 160$ |
| 6 | $160 = 6 \times 23 + 22$ | $\times 10 = 220$ |
| 9 | $220 = 9 \times 23 + 13$ | $\times 10 = 130$ |
| 5 | $130 = 5 \times 23 + 15$ | $\times 10 = 150$ |
| 6 | $150 = 6 \times 23 + 12$ | $\times 10 = 120$ |
| 5 | $120 = 5 \times 23 + 5$ | $\times 10 = 50$ |
| 2 | $50 = 2 \times 23 + 4$ | $\times 10 = 40$ |
| 1 | $40 = 1 \times 23 + 17$ | $\times 10 = 170$ |
| 7 | $170 = 7 \times 23 + 9$ | $\times 10 = 90$ |
| 3 | $90 = 3 \times 23 + 21$ | $\times 10 = 210$ |
| 9 | $210 = 9 \times 23 + 3$ | $\times 10 = 30$ |
| 1 | $30 = 1 \times 23 + 7$ | $\times 10 = 70$ |
| 3 | $70 = 3 \times 23 + 1$ | $\times 10 = 10$ |
| 0 | $10 = 0 \times 23 + 10$ | $\times 10 = 100$ |
| 4 | $100 = 4 \times 23 + 8$ | $\times 10 = 80$ |

電卓を使った尺取虫法

10桁の電卓を使いました。

$$1 \div 23 = 0.04347826$$

$$282 \times 23 = 17986$$

$$1000 - 986 = 14$$

$$14 \div 23 = 0.608695652$$

$$565 \times 23 = 12995$$

$$1000 - 995 = 5$$

$$5 \div 23 = 0.217391304$$

$$130 \times 23 = 2990$$

$$1000 - 990 = 10$$

$$10 \div 23 = 0.434782608$$

$$913 \times 23 = 20999$$

$$1000 - 999 = 1$$

$$1 \div 23 = 0.\overset{\circ}{0}4347826086956$$

$$5217391\overset{\circ}{3}$$