

①正負の数	標準時間	4分00秒
(四則混合)	速い時間	2分30秒

$$5 + (-4) - (-7) = 8$$

$$\frac{1}{4} \div \left(\frac{2}{5} - 1 \right) \times \left(-\frac{9}{10} \right) = \frac{3}{8}$$

$$-16 + 3 - 12 + 21 = -4$$

$$\left(-\frac{2}{3} \right)^2 \div \frac{1}{6} \times \frac{3}{4} = 2$$

$$-4^2 + 22 = 6$$

$$(-0.25)^2 \div \frac{1}{16} \times (-0.5)^3 = -\frac{1}{8}$$

$$-3^2 + (-2)^2 = -5$$

$$\left(-\frac{3}{4} \right)^2 \times \frac{2^2}{3} \div \left(-\frac{1}{12} \right) = -9$$

$$0.25 - \left(2 - \frac{5}{2} \right) = \frac{3}{4}$$

$$6 - 2 \times 5 = -4$$

$$\frac{1}{3} - \frac{1}{4} - \left(-\frac{5}{6} \right) = \frac{11}{12}$$

$$15 + 4 \div (-2) = 13$$

$$-7 \times (9 - 13) = 28$$

$$5 - 12 \div (-3) = 9$$

$$(-5^2) \times (-4) \div (-2)^2 = 25$$

$$(-2)^3 - 3 \times (-4) = 4$$

$$(-4)^2 \times \left(-\frac{1}{8} \right) \div \left(-\frac{1}{2^2} \right) = 8$$

$$-(-2)^2 - 4 \times (-2^2) = 12$$

$$(-4)^2 \times 5 - (-2)^3 \times (-3^2) = 8$$

②正負の数	標準時間	7 分 00 秒
(四則混合)	速い時間	5 分 00 秒

$$-2^2 - 4 \div \frac{1}{2} \div (-0.4) = 16$$

$$\left(1.25 - \frac{3}{2}\right) \div \left(-\frac{1}{2}\right)^4 = -4$$

$$\{-4^2 - (-2)^3\} \div (-2)^3 = 1$$

$$1 + \left(\frac{1}{2} - \frac{2}{3}\right) \div \frac{1}{2} = \frac{2}{3}$$

$$4 + (2 - 5) - \{2 - (3 - 6)\}^2 = -24$$

$$(-3)^2 \times \{(-2) - (-6^2) \div 4\} - 4^2 = 47$$

$$\left(\frac{2}{3} - \frac{3}{4}\right) \times (-6) \div \frac{3}{2} = \frac{1}{3}$$

$$\left\{-\frac{1}{4} - \left(-\frac{2}{3}\right)^2 \times \left(-\frac{1}{2}\right)\right\} \times 72 = -2$$

$$\frac{-6}{1 - \frac{5}{4}} = 24$$

$$27 \div (-3^2) - (-4)^2 \div (-2) + (-2)^3 = -3$$

$$\frac{7}{6} \div 3.5 + \left(-\frac{1}{2}\right)^3 = \frac{5}{24}$$

$$\frac{2}{3} + \frac{5}{6} \times \left(-\frac{3}{5}\right) = \frac{1}{6}$$

$$(-3) \times \left(-\frac{1}{6}\right) + 5 \div \left(-\frac{2}{3}\right) = -7$$

$$2 \times (-4) - \frac{7}{2} \div \left(-\frac{3}{14}\right) = 8\frac{1}{3}$$

$$\{2^8 - 2^7 \times (-4)\} \div (-2)^5 = -24$$

$$1 + \frac{-1}{2 + \frac{1}{3}} = \frac{4}{7}$$

$$(-3)^2 - (-2^2) - 4 \div (-2) = 15$$

$$\frac{\frac{1}{3} - 1}{\frac{1}{2} - 1} - \frac{\frac{1}{2} + 1}{\frac{1}{3} + 1} = \frac{5}{24}$$

③正負の数	標準時間	6 分 00 秒
(四則混合)	速い時間	4 分 00 秒

$$\left(-\frac{1}{2}+3\right) \times (-2)^2+18 \div (-3)^2=12$$

$$\frac{5}{3}-\left(-\frac{2}{3}\right)^2 \div \frac{1}{3}-2^3 \times\left(-\frac{1}{6}\right)=\frac{5}{3}$$

$$(-4)^2 \div (-2)^3-2 \frac{1}{4} \times\left(-1 \frac{1}{3}\right)^2=-6$$

$$\left\{\frac{2}{3}-\frac{1}{4}-\left(-\frac{1}{2}\right)^3 \times\left(-\frac{1}{3}\right)\right\} \times \frac{4}{15}=\frac{1}{10}$$

$$-\frac{3^2}{2^3} \times\{-2+7-(-3)\}-(-4^2) \div(-2)^3=-11$$

$$\left[\left\{3-\left(-\frac{5}{4}\right) \times\left(-\frac{10}{3}\right)\right\} \div 3 \frac{1}{2}+\frac{1}{4}\right]^2=\frac{1}{144}$$

$$-\frac{4}{7} \times\left\{\left(-\frac{3}{4}\right)^2-\frac{1}{36} \div\left(-\frac{1}{3}\right)^3\right\}+\left(-\frac{2}{3}\right)=-\frac{17}{12}$$

$$\left\{\frac{(-2)^3}{3}+\left(-2 \frac{1}{3}\right)^2 \times\left(\frac{1}{4}-\frac{1}{7}+\frac{3}{28}\right)\right\} \div(-1.5)=1$$

$$\frac{1}{6}+\frac{(-2)^2}{3} \div\left(-\frac{2}{9}\right)-\left(\frac{3}{2}\right)^3 \times\left(-\frac{2}{9}\right)^2=-6$$

④展開や因数分解の利用	標準時間	4 分 00 秒
	速い時間	2 分 40 秒

$$98 \times 102 = 9996$$

$$98 \times 98 = 9604$$

$$97 \times 97 = 9409$$

$$66 \times 63 = 4158$$

$$23 \times 73 = 1679$$

$$84^2 - 16^2 = 6800$$

$$52^2 - 51^2 = 103$$

$$36^2 - 24^2 + 41^2 - 19^2 = 2040$$

$$25^2 - 24^2 + 23^2 - 22^2 + 21^2 - 20^2 = 135$$

$$31 \times 18 + 26 \times 12 + 18 \times 26 + 31 \times 12 = 1710$$

$$65 \times 63 + 66 \times 66 - 66 \times 64 - 65 \times 65 = 2$$

$$85 \times 84 - 84 \times 83 + 85 \times 86 - 83 \times 86 = 340$$

$$1^2 - 3^2 + 5^2 - 7^2 + 9^2 - 11^2 + 13^2 - 15^2 + 17^2 - 19^2 = -200$$

⑤数列の和など・第 26 ～ 28, 30 項対応	標準時間	5 分 00 秒
	速い時間	3 分 30 秒

$$37 + 39 + 46 + 42 + 41 + 37 = 242$$

$$203 + 198 + 199 + 203 + 204 + 195 = 1202$$

$$(128.1 + 131 + 132.5 + 129.4 + 130.3 + 129.9) \div 6 = 130.2$$

$$1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 = 36$$

$$1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 = 45$$

$$1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17 + 19 = 100$$

$$2 + 5 + 8 + 11 + 14 + 17 + 20 + 23 + 26 + 29 = 155$$

$$3 + 7 + 11 + 15 + 19 + 23 + 27 + 31 + 35 + 39 = 210$$

$$1 + 2 + 4 + 8 + 16 + 32 + 64 + 128 + 256 + 512 = 1023$$

$$2 + 6 + 18 + 54 + 162 + 486 + 1458 + 4374 = 6560$$

$$1 \times 2 + 2 \times 3 + 3 \times 4 + 4 \times 5 + 5 \times 6 + 6 \times 7 + 7 \times 8 + 8 \times 9 = 240$$

$$1 \times 2 \times 3 + 2 \times 3 \times 4 + 3 \times 4 \times 5 + 4 \times 5 \times 6 + 5 \times 6 \times 7 = 420$$

$$1 \times 2 \times 3 \times 4 + 2 \times 3 \times 4 \times 5 + 3 \times 4 \times 5 \times 6 + 4 \times 5 \times 6 \times 7 + 5 \times 6 \times 7 \times 8 \\ = 3024$$

$$1^2 + 2^2 + 3^2 + 4^2 + 5^2 + 6^2 + 7^2 + 8^2 + 9^2 + 10^2 = 385$$

⑥差分	第 29 項対応	標準時間	8 分 00 秒
		速い時間	4 分 00 秒

$$\frac{1}{1 \times 2} + \frac{1}{2 \times 3} + \frac{1}{3 \times 4} + \frac{1}{4 \times 5} + \frac{1}{5 \times 6} + \frac{1}{6 \times 7} = \frac{6}{7}$$

$$\frac{1}{1 \times 3} + \frac{1}{3 \times 5} + \frac{1}{5 \times 7} + \frac{1}{7 \times 9} + \frac{1}{9 \times 11} + \frac{1}{11 \times 13} = \frac{6}{13}$$

$$\frac{1}{1 \times 4} + \frac{1}{4 \times 7} + \frac{1}{7 \times 10} + \frac{1}{10 \times 13} + \frac{1}{13 \times 16} + \frac{1}{16 \times 19} = \frac{6}{19}$$

$$\frac{3}{1^2 \times 2^2} + \frac{5}{2^2 \times 3^2} + \frac{7}{3^2 \times 4^2} + \frac{9}{4^2 \times 5^2} + \frac{11}{5^2 \times 6^2} + \frac{13}{6^2 \times 7^2} = \frac{48}{49}$$

$$\begin{aligned} & \frac{1}{1} + \frac{1}{1+2} + \frac{1}{1+2+3} + \frac{1}{1+2+3+4} + \frac{1}{1+2+3+4+5} \\ & + \frac{1}{1+2+3+4+5+6} = \frac{12}{7} \end{aligned}$$

$$\frac{1}{2!} + \frac{2}{3!} + \frac{3}{4!} + \frac{4}{5!} + \frac{5}{6!} + \frac{6}{7!} = \frac{5039}{5040}$$

$$\frac{1}{2^2-1} + \frac{1}{4^2-1} + \frac{1}{6^2-1} + \frac{1}{8^2-1} + \frac{1}{10^2-1} + \frac{1}{12^2-1} = \frac{6}{13}$$

$$\frac{1}{1 \times 2 \times 3} + \frac{1}{2 \times 3 \times 4} + \frac{1}{3 \times 4 \times 5} + \frac{1}{4 \times 5 \times 6} + \frac{1}{5 \times 6 \times 7} + \frac{1}{6 \times 7 \times 8} = \frac{27}{112}$$

$$\frac{1}{1 \times 2} + \frac{2}{2 \times 4} + \frac{4}{4 \times 8} + \frac{8}{8 \times 16} + \frac{16}{16 \times 32} + \frac{32}{32 \times 64} = \frac{63}{64}$$

$$\begin{aligned} & \frac{1}{x(x+1)} + \frac{1}{(x+1)(x+2)} + \frac{1}{(x+2)(x+3)} + \frac{1}{(x+3)(x+4)} \\ & + \frac{1}{(x+4)(x+5)} + \frac{1}{(x+5)(x+6)} = \frac{6}{x(x+6)} \end{aligned}$$

■ 次の各数を素因数分解せよ。

$$12 = 2^2 \times 3$$

$$105 = 3 \times 5 \times 7$$

$$18 = 2 \times 3^2$$

$$1001 = 7 \times 11 \times 13$$

$$24 = 2^3 \times 3$$

$$999 = 3^3 \times 37$$

$$48 = 2^4 \times 3$$

$$600 = 2^3 \times 3 \times 5^2$$

$$60 = 2^2 \times 3 \times 5$$

$$96 = 2^5 \times 3$$

$$343 = 7^3$$

$$144 = 2^4 \times 3^2$$

$$360 = 2^3 \times 3^2 \times 5$$

$$132 = 2^2 \times 3 \times 11$$

$$196 = 2^2 \times 7^2$$

$$90 = 2 \times 3^2 \times 5$$

$$625 = 5^4$$

$$150 = 2 \times 3 \times 5^2$$

$$72 = 2^3 \times 3^2$$

$$10000 = 2^4 \times 5^4$$

$$180 = 2^2 \times 3^2 \times 5$$

$$80 = 2^4 \times 5$$

$$36 = 2^2 \times 3^2$$

$$192 = 2^6 \times 3$$

$$126 = 2 \times 3^2 \times 7$$

$$300 = 2^2 \times 3 \times 5^2$$

$$108 = 2^2 \times 3^3$$

$$168 = 2^3 \times 3 \times 7$$

$$216 = 2^3 \times 3^3$$

$$54 = 2 \times 3^3$$

$$160 = 2^5 \times 5$$

$$504 = 2^3 \times 3^2 \times 7$$

$$91 = 7 \times 13$$

$$840 = 2^3 \times 3 \times 5 \times 7$$

■ 次の各数を () 内の数で割ったときの余りを求めよ。

$$2 \times 2 \times 2 \times 2 \times 2 \quad (3) \quad 2$$

$$5 \times 5 \times 5 \times 5 \times 5 \times 5 \times 5 \quad (6) \quad 5$$

$$7^3 \times 4^2 \quad (5) \quad 3$$

$$10^2 + 11^2 + 12^2 \quad (13) \quad 1$$

$$1 + 2 + 3 + 4 + \dots + 99 + 100 \quad (7) \quad 3$$

$$1^2 + 2^2 + 3^2 + 4^2 + 5^2 + 6^2 + 7^2 + 8^2 + 9^2 + 10^2 \quad (3) \quad 1$$

$$2^{100} \quad (13) \quad 3$$

$$103 \times 101 + 101 \times 102 + 37 \times 36 \quad (10) \quad 7$$

$$19^{19} + 17^{17} \quad (18) \quad 0$$

$$100000000 \quad (17) \quad 16$$

$$31156 \quad (9) \quad 7$$

$$1111111 \quad (9) \quad 7$$

$$12345678 \quad (9) \quad 0$$

$$341 \times 7225 \quad (9) \quad 2$$

$$1052872 \times 4718926 \quad (9) \quad 7$$

$$107^5 \times 371 - 109^3 \times 32 \quad (9) \quad 2$$

$$187251 \quad (11) \quad 9$$

⑨互除法もどき・第 38 項対応	標準時間	3 分 00 秒
	速い時間	1 分 50 秒

■ 次の各 2 数の最大公約数を求めよ。

9 と 12	3
24 と 36	12
30 と 75	15
48 と 60	12
144 と 216	72
60 と 24	12
180 と 144	36
330 と 363	33
297 と 351	27
96 と 72	24
825 と 150	75
182 と 266	14
195 と 221	13
294 と 210	42
595 と 665	35
1001 と 1040	13