

1. 次の数を 10 進法で表せ。【各 1 点】

- (1) $10111_{(2)}$ (2) $1210_{(3)}$ (3) $443_{(5)}$ (4) $0.124_{(5)}$

2. 次の 10 進数を [] 内の表し方で表せ。【各 2 点】

- (1) 18 [2 進法] (2) 71 [3 進法] (3) 250 [5 進法] (4) 0.9375 [4 進法]

3. 次の計算の結果を 2 進法で表せ。【各 2 点】

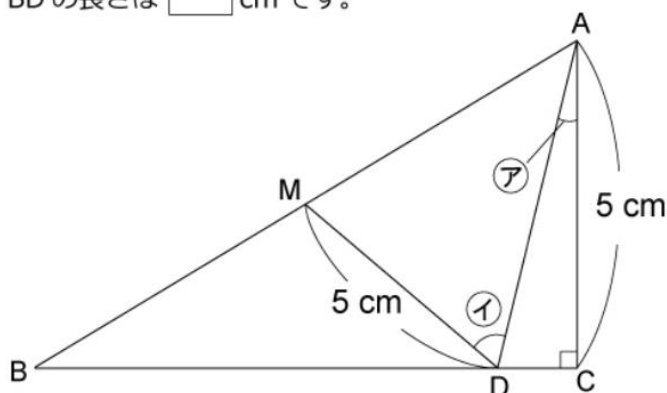
- (1) $1101_{(2)} + 1011_{(2)}$ (2) $10110_{(2)} - 1101_{(2)}$
 (3) $1011_{(2)} \times 111_{(2)}$ (4) $100001_{(2)} \div 11_{(2)}$

<Challenge!!>

- ①自然数 N を 6 進法と 9 進法で表すと、それぞれ 3 桁の数 $abc_{(6)}$ と $cab_{(9)}$ になる
 という。このとき、 a , b , c の値を求めよ。また N を 10 進法で表せ。

<楽しい角度問題>2013 灘中より

直角三角形 ABC で、M は辺 AB の真ん中の点です。また、 $\textcircled{ア}$ の角の大きさは 15 度、AC と MD の長さはともに 5 cm です。このとき、 $\textcircled{イ}$ の角の大きさは 度、BD の長さは cm です。



類 題

1. 次の数を 10 進法で表せ。

- (1) 1101101₍₂₎ (2) 1212₍₃₎ (3) 20121₍₃₎
 (4) 24011₍₅₎ (5) 465₍₇₎ (6) 1316₍₇₎
 (7) 0.0101₍₂₎ (8) 0.432₍₅₎

2. 次の 10 進数を[]内の表し方で表せ。

- (1) 201 [2 進法] (2) 188 [3 進法] (3) 414 [5 進法]
 (4) 2276 [7 進法] (5) 0.6875 [2 進法] (6) 0.776 [5 進法]

3. 次の数を 10 進法で表せ。

- (1) 1011₍₂₎ + 1110₍₂₎ (2) 10011₍₂₎ + 11101₍₂₎
 (3) 1101₍₂₎ - 111₍₂₎ (4) 11011₍₂₎ - 1101₍₂₎
 (5) 110₍₂₎ × 101₍₂₎ (6) 1101₍₂₎ × 110₍₂₎
 (7) 10101₍₂₎ ÷ 11₍₂₎ (8) 110010₍₂₎ ÷ 101₍₂₎

※配点 ①～⑫ 各 0.5 点

⑪ イッカンした態度		⑨ ジミある文章が心の琴線に触れる		⑦ あまりの言葉にフンゼンと席と立った		⑤ 客人をベッテイに案内する		③ 大学病院のゲカに入院した		① シンカンとした境内	
⑫ 清濁アワセのお広量な人物だった		⑩ 専門用語がヒンシュツする		⑧ 征服者にキョウジュンの意を表する		⑥ 天下のゴウケツとして名が轟く		④ 叔父はカモクな人だった		② さまざまないがらの米が並んでいる	

漢検準 2 級 漢字テスト 45 氏名
 次の文のカタカナを漢字に直せ。(送り仮名もかく)

$$(1) 10114$$

$$(2) 12104$$

$$= 1 \times 2^4 + 0 \times 2^3 + 1 \times 2^2 + 1 \times 2^1 + 0 \times 2^0 = 16 + 0 + 4 + 2 + 0 = 22$$

$$= 16 + 0 + 4 + 2 + 0 = 22$$

$$= 23$$

$$(3) 443$$

$$(4) 0.124$$

$$= 4 \times 5^3 + 4 \times 5^2 + 3 \times 5^1 = 500 + 100 + 15 = 615$$

$$= 100 + 30 + 3 = 133$$

$$= 123$$

$$211 \quad 18 = 10010$$

$$(2) 71 = 2122$$

$$\begin{array}{r} 218 \\ 2 \overline{) 9 \dots 0} \\ \underline{4} \dots 1 \\ 2 \overline{) 4 \dots 1} \\ \underline{2} \dots 0 \\ 2 \overline{) 2 \dots 0} \\ \underline{0} \dots 0 \end{array}$$

$$\begin{array}{r} 3171 \\ 3 \overline{) 23} \dots 2 \\ \underline{3} \dots 7 \\ 3 \overline{) 7} \dots 1 \\ \underline{6} \dots 1 \\ 0 \dots 2 \end{array}$$

$$(3) 250 = 2000$$

$$(4) 0.9375 = 0.33$$

$$\begin{array}{r} 5 \overline{) 250} \\ \underline{5} \dots 0 \\ 5 \overline{) 10} \dots 0 \\ \underline{5} \dots 0 \\ 5 \overline{) 2} \dots 0 \\ \underline{0} \dots 2 \end{array}$$

$$\begin{array}{r} 0.9375 \\ \times 0.33 \\ \hline 28125 \\ 28125 \\ \hline 31000 \end{array}$$

$$(1) 111$$

$$(2) 202$$

$$(3) 1011$$

$$+ 1011$$

$$- 1101$$

$$/ 1011$$

$$(4) 11100001$$

$$1100$$

$$11$$

<Challenge>

- ① $adbc$ と $acdb$ はともに3桁の数であり、共に7で割れるから $1 \leq a \leq 6, 0 \leq b \leq 5, 1 \leq c \leq 5$
- $adbc = a^2 + b^2 + c^2 + 36a + 6b + c \dots \dots \textcircled{1}$
- この2数は同じ数であるから $36a + 6b + c = 81c + 9a + b$
- ゆえに $27a = 80c - 8b$ すなわち $27a = 8(10c - b) \dots \dots \textcircled{2}$
- 8と27は互いに素であるから、8は左の因数である。
- $1 \leq a \leq 5$ であるから $a = 8$
- ②に代入して整理すると $16c = b + 27 \dots \dots \textcircled{3}$
- よって $b + 27$ は16の倍数である。
- $0 \leq b \leq 5$ より、 $27 \leq b + 27 \leq 32$ であるから $b + 27 = 32$
- よって $b = 5$ ③から $c = 2$ (1と5を代入)
- 以上から $a = 8, b = 5, c = 2$
- この値を①に代入して $N = 36 \times 8 + 6 \times 5 + 2 = 312$
- ② (1) N は3桁の数で、10で割る商は2であるから $2 \leq N < 30$ すなわち $2 \leq N < 30$
- この条件を満たす自然数 N の個数は
- $2 - 1 = 1$ (2) $10 - 1 = 9$ (3) $20 - 1 = 19$ (4) $30 - 1 = 29$ (5) $40 - 1 = 39$ (6) $50 - 1 = 49$ (7) $60 - 1 = 59$ (8) $70 - 1 = 69$ (9) $80 - 1 = 79$ (10) $90 - 1 = 89$ (11) $100 - 1 = 99$ (12) $110 - 1 = 109$ (13) $120 - 1 = 119$ (14) $130 - 1 = 129$ (15) $140 - 1 = 139$ (16) $150 - 1 = 149$ (17) $160 - 1 = 159$ (18) $170 - 1 = 169$ (19) $180 - 1 = 179$ (20) $190 - 1 = 189$ (21) $200 - 1 = 199$ (22) $210 - 1 = 209$ (23) $220 - 1 = 219$ (24) $230 - 1 = 229$ (25) $240 - 1 = 239$ (26) $250 - 1 = 249$ (27) $260 - 1 = 259$ (28) $270 - 1 = 269$ (29) $280 - 1 = 279$ (30) $290 - 1 = 289$ (31) $300 - 1 = 299$ (32) $310 - 1 = 309$ (33) $320 - 1 = 319$ (34) $330 - 1 = 329$ (35) $340 - 1 = 339$ (36) $350 - 1 = 349$ (37) $360 - 1 = 359$ (38) $370 - 1 = 369$ (39) $380 - 1 = 379$ (40) $390 - 1 = 389$ (41) $400 - 1 = 399$ (42) $410 - 1 = 409$ (43) $420 - 1 = 419$ (44) $430 - 1 = 429$ (45) $440 - 1 = 439$ (46) $450 - 1 = 449$ (47) $460 - 1 = 459$ (48) $470 - 1 = 469$ (49) $480 - 1 = 479$ (50) $490 - 1 = 489$ (51) $500 - 1 = 499$ (52) $510 - 1 = 509$ (53) $520 - 1 = 519$ (54) $530 - 1 = 529$ (55) $540 - 1 = 539$ (56) $550 - 1 = 549$ (57) $560 - 1 = 559$ (58) $570 - 1 = 569$ (59) $580 - 1 = 579$ (60) $590 - 1 = 589$ (61) $600 - 1 = 599$ (62) $610 - 1 = 609$ (63) $620 - 1 = 619$ (64) $630 - 1 = 629$ (65) $640 - 1 = 639$ (66) $650 - 1 = 649$ (67) $660 - 1 = 659$ (68) $670 - 1 = 669$ (69) $680 - 1 = 679$ (70) $690 - 1 = 689$ (71) $700 - 1 = 699$ (72) $710 - 1 = 709$ (73) $720 - 1 = 719$ (74) $730 - 1 = 729$ (75) $740 - 1 = 739$ (76) $750 - 1 = 749$ (77) $760 - 1 = 759$ (78) $770 - 1 = 769$ (79) $780 - 1 = 779$ (80) $790 - 1 = 789$ (81) $800 - 1 = 799$ (82) $810 - 1 = 809$ (83) $820 - 1 = 819$ (84) $830 - 1 = 829$ (85) $840 - 1 = 839$ (86) $850 - 1 = 849$ (87) $860 - 1 = 859$ (88) $870 - 1 = 869$ (89) $880 - 1 = 879$ (90) $890 - 1 = 889$ (91) $900 - 1 = 899$ (92) $910 - 1 = 909$ (93) $920 - 1 = 919$ (94) $930 - 1 = 929$ (95) $940 - 1 = 939$ (96) $950 - 1 = 949$ (97) $960 - 1 = 959$ (98) $970 - 1 = 969$ (99) $980 - 1 = 979$ (100) $990 - 1 = 989$ (101) $1000 - 1 = 999$ (102) $1010 - 1 = 1009$ (103) $1020 - 1 = 1019$ (104) $1030 - 1 = 1029$ (105) $1040 - 1 = 1039$ (106) $1050 - 1 = 1049$ (107) $1060 - 1 = 1059$ (108) $1070 - 1 = 1069$ (109) $1080 - 1 = 1079$ (110) $1090 - 1 = 1089$ (111) $1100 - 1 = 1099$ (112) $1110 - 1 = 1109$ (113) $1120 - 1 = 1119$ (114) $1130 - 1 = 1129$ (115) $1140 - 1 = 1139$ (116) $1150 - 1 = 1149$ (117) $1160 - 1 = 1159$ (118) $1170 - 1 = 1169$ (119) $1180 - 1 = 1179$ (120) $1190 - 1 = 1189$ (121) $1200 - 1 = 1199$ (122) $1210 - 1 = 1209$ (123) $1220 - 1 = 1219$ (124) $1230 - 1 = 1229$ (125) $1240 - 1 = 1239$ (126) $1250 - 1 = 1249$ (127) $1260 - 1 = 1259$ (128) $1270 - 1 = 1269$ (129) $1280 - 1 = 1279$ (130) $1290 - 1 = 1289$ (131) $1300 - 1 = 1299$ (132) $1310 - 1 = 1309$ (133) $1320 - 1 = 1319$ (134) $1330 - 1 = 1329$ (135) $1340 - 1 = 1339$ (136) $1350 - 1 = 1349$ (137) $1360 - 1 = 1359$ (138) $1370 - 1 = 1369$ (139) $1380 - 1 = 1379$ (140) $1390 - 1 = 1389$ (141) $1400 - 1 = 1399$ (142) $1410 - 1 = 1409$ (143) $1420 - 1 = 1419$ (144) $1430 - 1 = 1429$ (145) $1440 - 1 = 1439$ (146) $1450 - 1 = 1449$ (147) $1460 - 1 = 1459$ (148) $1470 - 1 = 1469$ (149) $1480 - 1 = 1479$ (150) $1490 - 1 = 1489$ (151) $1500 - 1 = 1499$ (152) $1510 - 1 = 1509$ (153) $1520 - 1 = 1519$ (154) $1530 - 1 = 1529$ (155) $1540 - 1 = 1539$ (156) $1550 - 1 = 1549$ (157) $1560 - 1 = 1559$ (158) $1570 - 1 = 1569$ (159) $1580 - 1 = 1579$ (160) $1590 - 1 = 1589$ (161) $1600 - 1 = 1599$ (162) $1610 - 1 = 1609$ (163) $1620 - 1 = 1619$ (164) $1630 - 1 = 1629$ (165) $1640 - 1 = 1639$ (166) $1650 - 1 = 1649$ (167) $1660 - 1 = 1659$ (168) $1670 - 1 = 1669$ (169) $1680 - 1 = 1679$ (170) $1690 - 1 = 1689$ (171) $1700 - 1 = 1699$ (172) $1710 - 1 = 1709$ (173) $1720 - 1 = 1719$ (174) $1730 - 1 = 1729$ (175) $1740 - 1 = 1739$ (176) $1750 - 1 = 1749$ (177) $1760 - 1 = 1759$ (178) $1770 - 1 = 1769$ (179) $1780 - 1 = 1779$ (180) $1790 - 1 = 1789$ (181) $1800 - 1 = 1799$ (182) $1810 - 1 = 1809$ (183) $1820 - 1 = 1819$ (184) $1830 - 1 = 1829$ (185) $1840 - 1 = 1839$ (186) $1850 - 1 = 1849$ (187) $1860 - 1 = 1859$ (188) $1870 - 1 = 1869$ (189) $1880 - 1 = 1879$ (190) $1890 - 1 = 1889$ (191) $1900 - 1 = 1899$ (192) $1910 - 1 = 1909$ (193) $1920 - 1 = 1919$ (194) $1930 - 1 = 1929$ (195) $1940 - 1 = 1939$ (196) $1950 - 1 = 1949$ (197) $1960 - 1 = 1959$ (198) $1970 - 1 = 1969$ (199) $1980 - 1 = 1979$ (200) $1990 - 1 = 1989$ (201) $2000 - 1 = 1999$ (202) $2010 - 1 = 2009$ (203) $2020 - 1 = 2019$ (204) $2030 - 1 = 2029$ (205) $2040 - 1 = 2039$ (206) $2050 - 1 = 2049$ (207) $2060 - 1 = 2059$ (208) $2070 - 1 = 2069$ (209) $2080 - 1 = 2079$ (210) $2090 - 1 = 2089$ (211) $2100 - 1 = 2099$ (212) $2110 - 1 = 2109$ (213) $2120 - 1 = 2119$ (214) $2130 - 1 = 2129$ (215) $2140 - 1 = 2139$ (216) $2150 - 1 = 2149$ (217) $2160 - 1 = 2159$ (218) $2170 - 1 = 2169$ (219) $2180 - 1 = 2179$ (220) $2190 - 1 = 2189$ (221) $2200 - 1 = 2199$ (222) $2210 - 1 = 2209$ (223) $2220 - 1 = 2219$ (224) $2230 - 1 = 2229$ (225) $2240 - 1 = 2239$ (226) $2250 - 1 = 2249$ (227) $2260 - 1 = 2259$ (228) $2270 - 1 = 2269$ (229) $2280 - 1 = 2279$ (230) $2290 - 1 = 2289$ (231) $2300 - 1 = 2299$ (232) $2310 - 1 = 2309$ (233) $2320 - 1 = 2319$ (234) $2330 - 1 = 2329$ (235) $2340 - 1 = 2339$ (236) $2350 - 1 = 2349$ (237) $2360 - 1 = 2359$ (238) $2370 - 1 = 2369$ (239) $2380 - 1 = 2379$ (240) $2390 - 1 = 2389$ (241) $2400 - 1 = 2399$ (242) $2410 - 1 = 2409$ (243) $2420 - 1 = 2419$ (244) $2430 - 1 = 2429$ (245) $2440 - 1 = 2439$ (246) $2450 - 1 = 2449$ (247) $2460 - 1 = 2459$ (248) $2470 - 1 = 2469$ (249) $2480 - 1 = 2479$ (250) $2490 - 1 = 2489$ (251) $2500 - 1 = 2499$ (252) $2510 - 1 = 2509$ (253) $2520 - 1 = 2519$ (254) $2530 - 1 = 2529$ (255) $2540 - 1 = 2539$ (256) $2550 - 1 = 2549$ (257) $2560 - 1 = 2559$ (258) $2570 - 1 = 2569$ (259) $2580 - 1 = 2579$ (260) $2590 - 1 = 2589$ (261) $2600 - 1 = 2599$ (262) $2610 - 1 = 2609$ (263) $2620 - 1 = 2619$ (264) $2630 - 1 = 2629$ (265) $2640 - 1 = 2639$ (266) $2650 - 1 = 2649$ (267) $2660 - 1 = 2659$ (268) $2670 - 1 = 2669$ (269) $2680 - 1 = 2679$ (270) $2690 - 1 = 2689$ (271) $2700 - 1 = 2699$ (272) $2710 - 1 = 2709$ (273) $2720 - 1 = 2719$ (274) $2730 - 1 = 2729$ (275) $2740 - 1 = 2739$ (276) $2750 - 1 = 2749$ (277) $2760 - 1 = 2759$ (278) $2770 - 1 = 2769$ (279) $2780 - 1 = 2779$ (280) $2790 - 1 = 2789$ (281) $2800 - 1 = 2799$ (282) $2810 - 1 = 2809$ (283) $2820 - 1 = 2819$ (284) $2830 - 1 = 2829$ (285) $2840 - 1 = 2839$ (286) $2850 - 1 = 2849$ (287) $2860 - 1 = 2859$ (288) $2870 - 1 = 2869$ (289) $2880 - 1 = 2879$ (290) $2890 - 1 = 2889$ (291) $2900 - 1 = 2899$ (292) $2910 - 1 = 2909$ (293) $2920 - 1 = 2919$ (294) $2930 - 1 = 2929$ (295) $2940 - 1 = 2939$ (296) $2950 - 1 = 2949$ (297) $2960 - 1 = 2959$ (298) $2970 - 1 = 2969$ (299) $2980 - 1 = 2979$ (300) $2990 - 1 = 2989$ (301) $3000 - 1 = 2999$ (302) $3010 - 1 = 3009$ (303) $3020 - 1 = 3019$ (304) $3030 - 1 = 3029$ (305) $3040 - 1 = 3039$ (306) $3050 - 1 = 3049$ (307) $3060 - 1 = 3059$ (308) $3070 - 1 = 3069$ (309) $3080 - 1 = 3079$ (310) $3090 - 1 = 3089$ (311) $3100 - 1 = 3099$ (312) $3110 - 1 = 3109$ (313) $3120 - 1 = 3119$ (314) $3130 - 1 = 3129$ (315) $3140 - 1 = 3139$ (316) $3150 - 1 = 3149$ (317) $3160 - 1 = 3159$ (318) $3170 - 1 = 3169$ (319) $3180 - 1 = 3179$ (320) $3190 - 1 = 3189$ (321) $3200 - 1 = 3199$ (322) $3210 - 1 = 3209$ (323) $3220 - 1 = 3219$ (324) $3230 - 1 = 3229$ (325) $3240 - 1 = 3239$ (326) $3250 - 1 = 3249$ (327) $3260 - 1 = 3259$ (328) $3270 - 1 = 3269$ (329) $3280 - 1 = 3279$ (330) $3290 - 1 = 3289$ (331) $3300 - 1 = 3299$ (332) $3310 - 1 = 3309$ (333) $3320 - 1 = 3319$ (334) $3330 - 1 = 3329$ (335) $3340 - 1 = 3339$ (336) $3350 - 1 = 3349$ (337) $3360 - 1 = 3359$ (338) $3370 - 1 = 3369$ (339) $3380 - 1 = 3379$ (340) $3390 - 1 = 3389$ (341) $3400 - 1 = 3399$ (342) $3410 - 1 = 3409$ (343) $3420 - 1 = 3419$ (344) $3430 - 1 = 3429$ (345) $3440 - 1 = 3439$ (346) $3450 - 1 = 3449$ (347) $3460 - 1 = 3459$ (348) $3470 - 1 = 3469$ (349) $3480 - 1 = 3479$ (350) $3490 - 1 = 3489$ (351) $3500 - 1 = 3499$ (352) $3510 - 1 = 3509$ (353) $3520 - 1 = 3519$ (354) $3530 - 1 = 3529$ (355) $3540 - 1 = 3539$ (356) $3550 - 1 = 3549$ (357) $3560 - 1 = 3559$ (358) $3570 - 1 = 3569$ (359) $3580 - 1 = 3579$ (360) $3590 - 1 = 3589$ (361) $3600 - 1 = 3599$ (362) $3610 - 1 = 3609$ (363) $3620 - 1 = 3619$ (364) $3630 - 1 = 3629$ (365) $3640 - 1 = 3639$ (366) $3650 - 1 = 3649$ (367) $3660 - 1 = 3659$ (368) $3670 - 1 = 3669$ (369) $3680 - 1 = 3679$ (370) $3690 - 1 = 3689$ (371) $3700 - 1 = 3699$ (372) $3710 - 1 = 3709$ (373) $3720 - 1 = 3719$ (374) $3730 - 1 = 3729$ (375) $3740 - 1 = 3739$ (376) $3750 - 1 = 3749$ (377) $3760 - 1 = 3759$ (378) $3770 - 1 = 3769$ (379) $3780 - 1 = 3779$ (380) $3790 - 1 = 3789$ (381) $3800 - 1 = 3799$ (382) $3810 - 1 = 3809$ (383) $3820 - 1 = 3819$ (384) $3830 - 1 = 3829$ (385) $3840 - 1 = 3839$ (386) $3850 - 1 = 3849$ (387) $3860 - 1 = 3859$ (388) $3870 - 1 = 3869$ (389) $3880 - 1 = 3879$ (390) $3890 - 1 = 3889$ (391) $3900 - 1 = 3899$ (392) $3910 - 1 = 3909$ (393) $3920 - 1 = 3919$ (394) $3930 - 1 = 3929$ (395) $3940 - 1 = 3939$ (396) $3950 - 1 = 3949$ (397) $3960 - 1 = 3959$ (398) $3970 - 1 = 3969$ (399) $3980 - 1 = 3979$ (400) $3990 - 1 = 3989$ (401) $4000 - 1 = 3999$ (402) $4010 - 1 = 4009$ (403) $4020 - 1 = 4019$ (404) $4030 - 1 = 4029$ (405) $4040 - 1 = 4039$ (406) $4050 - 1 = 4049$ (407) $4060 - 1 = 4059$ (408) $4070 - 1 = 4069$ (409) $4080 - 1 = 4079$ (410) $4090 - 1 = 4089$ (411) $4100 - 1 = 4099$ (412) $4110 - 1 = 4109$ (413) $4120 - 1 = 4119$ (414) $4130 - 1 = 4129$ (415) $4140 - 1 = 4139$ (416) $4150 - 1 = 4149$ (417) $4160 - 1 = 4159$ (418) $4170 - 1 = 4169$ (419) $4180 - 1 = 4179$ (420) $4190 - 1 = 4189$ (421) $4200 - 1 = 4199$ (422) $4210 - 1 = 4209$ (423) $4220 - 1 = 4219$ (424) $4230 - 1 = 4229$ (425) $4240 - 1 = 4239$ (426) $4250 - 1 = 4249$ (427) $4260 - 1 = 4259$ (428) $4270 - 1 = 4269$ (429