

Number Bases - examples

- (1) Convert 73_8 to base 10.
- (2) Convert 162 to base 5.
- (3) Convert 101101011_2 to base 10.
- (4) Convert 617 to base 2.
- (5) Convert 113_6 to base 9.
- (6) If $4 + 5 = 10$ in some base b , what is b ?
- (7) If $6 \times 4 = 33$ in some base b , what is b ?
- (8) If $15 + 21 = 40$ in some base b , what is b ?
- (9) If $4 \times 6 = 30$ in some base, then what is $5!$ in this base?
- (10) A base-two numeral consists of 15 digits all of which are ones. This number when tripled and written in base two, contains how many digits?
- (11) Show that $10 \times 10 = 100$ in any base b .
- (12) Suppose that 37_b is exactly half of 73_b . What is b ?
- (13) Suppose that a certain integer x can be written as a two-digit number in both bases 5 and 6 where the first digit is 4. That is, $x = \underline{4y}_5$ and $x = \underline{4z}_6$ for some digits y, z . What is x (in base 10)?
- (14) A positive integer n can be written in base 7 as the three-digit number \underline{xyy} . The same number n can be written in base 6 as the three-digit number \underline{yxx} . Find n .
- (15) Let x and y be digits in base 7 such that

$$1111_2 + 1111_3 + 1111_4 + 1111_5 + 1111_6 + 1111_7 + 1111_8 + 1111_9 = \underline{xyxyx}_7 - 91$$

Find $x + y$.

- (16) In what base b is the following addition correct?

$$66 + 87 + 85 + 48 = 132$$

- (17) If $53 \times 8 = 235$ in some base b , what is b ?
- (18) If $440 + 340 = 1000$, what base is being used?
- (19) In what base(s) is 165 a divisor of 561?