

Practice day for remainder

THEOREM

$x^4 \equiv 1$

$$1) \frac{23}{5} = 3$$

$$2) \frac{49}{9} = 3$$

$$3) \frac{7^2}{4} = \frac{(3)^2}{4} = \frac{9}{4} = 1$$

$$4) \frac{7^5}{4} = \frac{(3)^5}{4} \Rightarrow \cancel{\frac{7}{4}} \cancel{(3)^5} \Rightarrow \frac{243}{4} = 3$$

$$5) \frac{(123 \times 124)}{9} = \frac{(6) \times 7}{9} \Rightarrow \frac{42}{9} = 6$$

$$6) \frac{(16)^{18}}{5} = (1)^{18} = 1$$

$$7) \frac{16^{18} \times 2^3}{5} \Rightarrow \frac{16^{18} \times 8}{5} \Rightarrow (1)^{18} \times 3 \Rightarrow 3$$

$$8) \frac{(81)^{41}}{5} \Rightarrow \cancel{(3)^{41}} \Rightarrow (1)^{41} = 1$$

$$9) \frac{81^{41} \times 3}{5} \Rightarrow 1 \times 3 \Rightarrow 3$$

$$10) \frac{243}{5} \Rightarrow 3$$

$$11) \frac{(243)^{165}}{5} \Rightarrow \frac{(3)^{165}}{5} \Rightarrow \frac{(3^4)^{41} \times 3^1}{5} \Rightarrow \frac{(1)^{41} \times 3^1}{5}$$

$$\Rightarrow 3$$

12) If a number n divided by 4 leaves
what is the remainder of $n^2 \div 4$?
 $\frac{n}{4} = 3$

$$\frac{7}{4} = 3$$

$$n = 7$$

$$\frac{49}{4} = \frac{7^2}{4} = \frac{(3)^2}{4} = \frac{9}{4} = 1$$

13) $\frac{25 \times 25}{26} \Rightarrow \frac{(25)^2}{26} \Rightarrow (-1)^2 = 1$

14) $\frac{17^{200}}{16} = (1)^{200} = 1$

15) $\frac{42 \times 8}{6} \Rightarrow 0 \times 2 = 0$

16) $\frac{49}{5} \Rightarrow 4$

17) $\frac{100 \times 101}{11} \Rightarrow \frac{(1) \times (2)}{\oplus} = 2$

$$18) \quad \frac{15 \times 17 \times 19}{4} \Rightarrow \frac{3 \times 1 \times 3}{4} = \frac{9}{4} = 1$$

$$19) \quad 3^3 \div 5 \Rightarrow \frac{3 \times 3 \times 3}{5} \Rightarrow \frac{9 \times 3}{5} \Rightarrow \frac{4 \times 3}{5} = 2$$

20) If $x \div 5$ gives remainder 2, what is the remainder of $(x+2) \div 5$?

$$\frac{12}{5} = 2$$

$$x = 12$$

$$(12+2) \div 5$$

$$\frac{14}{5} = 4$$