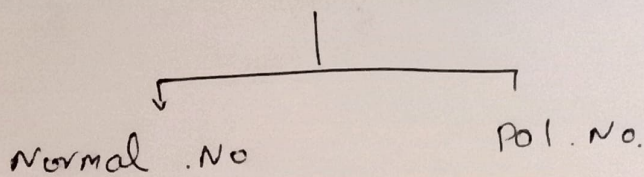


Day - 6

Remainder Theorem



$$2\frac{3}{5}$$

$$(x^2 + 7x + 3) \div (x + 2)$$

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

$$2) \frac{17}{6} = 5$$

$$3) \frac{786 \times 2}{11} = 9$$

$$4) \frac{(6) + (7) + (8)}{16} \Rightarrow 6 + 7 + 8 = 21$$

$$\Rightarrow \frac{21}{16} = 3$$

$$5) \frac{6 \times 7 \times 8}{9} = 9$$

$$= \frac{6 \times 7 \times 8}{9} = \frac{42 \times 8}{9} \Rightarrow \frac{48}{3} = 3$$

$$6) \frac{7^5}{4} = \frac{7 \times 7 \times 7 \times 7 \times 7}{4} \Rightarrow \frac{9 \times 9 \times 3}{4} = 1 \times 1 \times 3 = 3$$

$$2^1 = 2$$

$$2^2 = 4$$

$$2^3 = 8$$

$$2^4 = 16$$

$$2^5 = 32$$

Note

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

is not greater than 5

$$7) \frac{2^{75}}{5} = \frac{(2)^{75}}{5} = \frac{(2^4)^{19} \times 2^1}{5} = \frac{(1)^{19} \times 2}{5} = 2$$

$$8) \frac{7^{129}}{5} \Rightarrow \frac{(7)^{129}}{5} \Rightarrow \frac{(2)^{129}}{5} = \frac{(2^4)^{32} \times 2^1}{5} = 2$$

$$9) \left(\frac{517}{5} \right)^{517} = \frac{(2)^{517}}{5} = \frac{(2^4)^{517}}{5} = \frac{(16)^{517/4}}{5} = \frac{(2)^{129 \times 2}}{5} = 2$$

10) what is remainder when 2243^{165} divided by

$$\frac{(2243)^{165}}{5} = \frac{(3)^{165}}{5} = \frac{(2^4)^{41} \times 3^1}{5} = \frac{(1)^{41} \times 3^1}{5} = 3$$

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

$$2) \frac{47}{9} = 3$$

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

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

$$5) \frac{(123 \times 123)}{9} = \frac{(6) \times 3}{9} \Rightarrow \frac{12}{9} = 6$$

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

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

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

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

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

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

$$\Rightarrow 3$$

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

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

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

$$n = 7$$

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

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

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

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

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

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

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

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

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

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

$$x = 12$$

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

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