



a) $-1 + 4 + 9 + \dots$

i) $T_n = a + (n-1)d$ $d = 5$ $a = -1$ $n = 60$

$$T_{60} = -1 + (60-1) \times 5$$

$$= -1 + (59) \times 5$$

$$T_{60} = 304$$

ii) sum of 60

~~$S_n = \frac{n}{2}(a + (n-1)d)$~~

$$S_n = a(n \times 1)$$

$$S_n = -1(60 \times 304)$$

$$= -18240$$

b) a , $P = 100(1.23)^t$, $P = 100e^{at}$



c) $y = x^3 + x^2 - x + 2$ A and B are turning pt

i) coordinates of A & B

$\frac{dy}{dx} = 3x^2 + 2x - 1$ let $y = 0$ turning pt

$\therefore 3x^2 + 2x - 1 = 0$

$3x^2 \times x^{-1} = 3x^{-1}$

$(3x - 1)(x + 1) = 0$

$\therefore x = \frac{1}{3}$ or -1

When $x = \frac{1}{3}$ $y = \frac{5}{6}$

When $x = -1$ $y = 3$

$\therefore A = (-1, 3)$ $B = (\frac{1}{3}, \frac{5}{6})$

ii) $\frac{d^2y}{dx^2} = 6x + 2 = 0$

when $x = -1$ $x =$

$6x + 2 = 0 \Rightarrow x = -\frac{1}{3}$ or $\frac{1}{3}, \frac{5}{6}$ (Minimum)

iii) $x^3 + x^2 - x + 2 = k = 3, \frac{1}{3}, \frac{5}{6}$