6a $-1 + 4 + 9$

i. $a = -1 \quad d = 5$

$T_n = a + (n-1)d$

$T_{60} = -1 + (59)5$

$= -1 + 295$

$T_{60} = 294$

ii. $S_n = \frac{n}{2}[2a + (n-1)d]$

$S_{60} = \frac{60}{2}[2 \times -1 + 59 \times 5]$

$= 30[-2 + 295]$

$= 30 \times 293$

$S_{60} = 8790$

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6. $P = 100e^{\alpha t}$

$\frac{P}{100} = e^{\alpha t}$

$\ln\frac{P}{100} = \alpha t$

ci. $y = x^3 + x^2 - x + 2$

$\frac{dy}{dx} = 3x^2 + 2x - 1$

put $\frac{dy}{dx} = 0$

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

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

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

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

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

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

cont →

when $x = \frac{1}{3}$

$y = (\frac{1}{3})^3 + (\frac{1}{3})^2 - \frac{1}{3} + 2$

$= \frac{1}{27} + \frac{1}{9} - \frac{1}{3} + 2$

$= 2\frac{13}{27}$

when $x = -1$

$y = (-1)^3 + (-1)^2 + 1 + 2$

$= -1 + 1 + 1 + 2$

$= 3$

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

when $x = \frac{1}{3}$

$= 6 \times \frac{1}{3} + 2$

$= 4$

+ve $\therefore$ max

when $x = -1$

$= 6 \times -1 + 2$

$= -4$

-ve $\therefore$ min

$\therefore$ $A(-1, 3)$

$B(\frac{1}{3}, 2\frac{13}{27})$

ii. when $x = -1$, because this is where the curve is a minimum.

iii.