

51) A time study showed that, on average, the productivity of a worker after t hours on the job can be modeled by $P(t) = 27t + 6t^2 - t^3$; $0 \leq t \leq 8$

where P is the number of units per hour.

a) Find the critical values.

$$P'(t) = 27 + 12t - 3t^2 = 0$$

معادلة التربيعية
نحلها بالأسوأ أو
بالتفاضل

$$a = -3, b = 12, c = 27$$

$$\rightarrow t = \frac{-12 \pm \sqrt{12^2 - 4(-3)(27)}}{2(-3)}$$

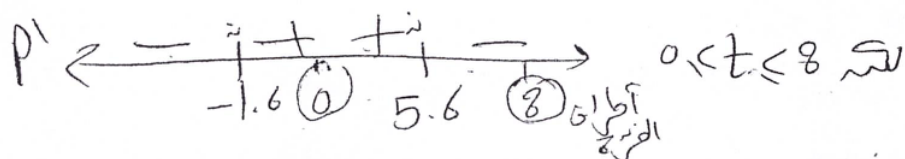
$$= \frac{-12 \pm \sqrt{468}}{-6} = \frac{-12 \pm 21.6}{-6} = -1.6 \text{ or } 5.6$$

b) Which critical values make sense in this model?

$$x = 5.6$$

لا معنى للوقت
لا يمكن أن يكون
بالسالب
5.6 و -1.6

c) For what values of t is P increasing?



$$\therefore 0 \leq t < 5.6 \text{ increasing}$$