

p-164 (12)

The sum of two numbers is 60. Determine the numbers if their product is a maximum

① Let x rep the first number; then

$$x + \boxed{?} = 60, \quad \boxed{?} = 60 - x$$

↑
2nd number

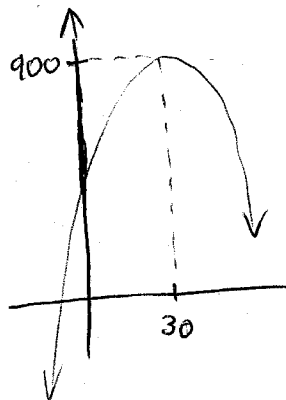
Let P represent the product of two numbers (in general)

② $P = x(60 - x)$,
re-write in standard form

③ $P = 60x - x^2$
 $P = -x^2 + 60x$

④ $P = -1(x^2 - 60x)$
 $P = -(x^2 - 60x + 900 - 900)$
 $P = -(x^2 - 60x + 900) + 900$
 $P = -(x - 30)^2 + 900$

⑤ The max value of P
is 900 when $x = 30$
and $60 - x$
 $= 60 - 30$
 $= 30$



⑥ Answer: the numbers are 30 and 30