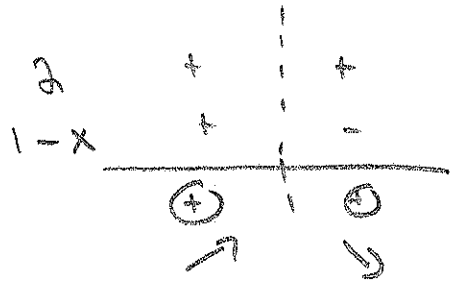
Math 4 Unit 7

U7 L1 I6 - optimization - Day 1

① $D = 2x - x^2$

$D' = 2 - 2x$

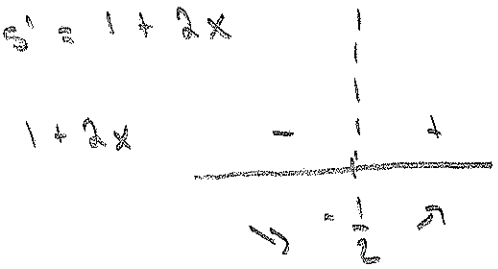
$2(1-x)$



max difference when $x = 1$

② $S = x + x^2$

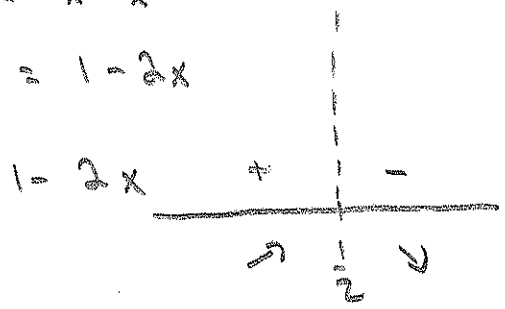
$S' = 1 + 2x$



min sum when $x = -\frac{1}{2}$

③ $D = x - x^2$

$D' = 1 - 2x$



max difference when $x = \frac{1}{2}$

④ $P = x \cdot y$ $\quad x - y = 10$

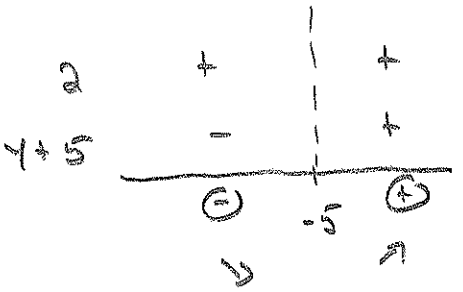
$x = y + 10$

$P(y) = y(y+10)$

$= y^2 + 10y$

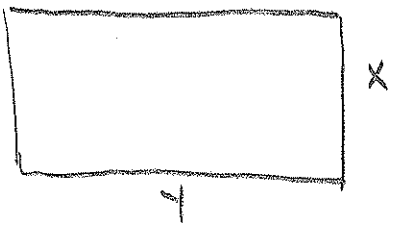
$P'(y) = 2y + 10$

$= 2(y+5)$



min product when $y = -5$, $x = 5$

⑤



$A = x \cdot y$

$A = x(50 - x)$

$A = 50x - x^2$

$A' = 50 - 2x$

$= 2(25 - x)$

$100 = 2x + 2y$

$50 = x + y$

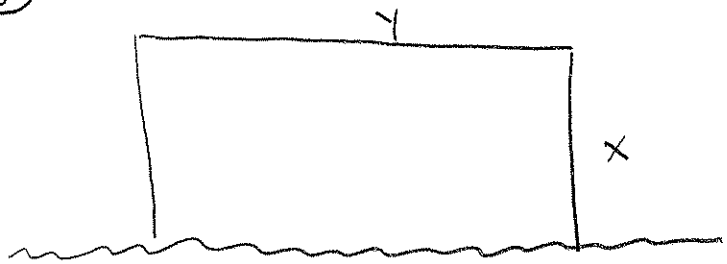
$y = 50 - x$

max area when $x = 25$

$y = 25$

max area of 625

(6)



$A = x \cdot y$

$100 = 2x + y$

$y = 100 - 2x$

$A(y) = y(100 - 2y)$

$= 100y - 2y^2$

$\frac{dA}{dx} = 100 - 4y$

$= 4(25 - y)$

y	+		+
$25 - y$	+		−
	⊕	25	⊖
	↗		↘

Max area when $y = 25$

$x = 50$