

Show your work in all problems.

1. A company's revenue from plasma TV sales,  $C$  (in hundreds of dollars), is a function of advertising expenditure,  $A$ , in hundreds of dollars, so  $C = f(A)$ .

(a) What does the company hope about the sign of  $f'$ ?

They hope  $f'$  is positive

(b) What does the statement  $f'(500) = 3$  mean in practical terms?

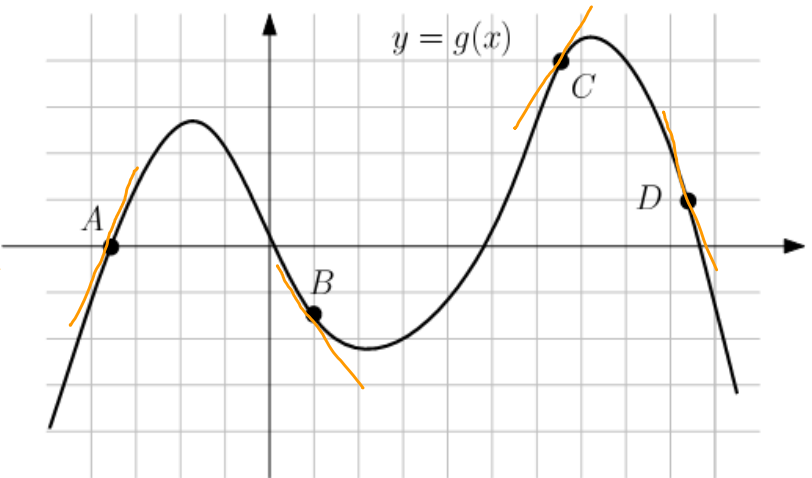
Near \$50000, each extra \$100 spent on advertising increases the revenue by \$300.

(c) If  $f'(500) = 0.8$ , should the company spend more or less than \$50000 on advertising? Explain why.

Less. For each extra \$100 spent on advertising the revenue increases only by \$80, so more money is spent compared to gained

2. Fill in the table of signs for  $g, g', g''$

	A	B	C	D	
$g$	0	-	+	+	function values
$g'$	+	-	+	-	slopes of tangent lines
$g''$	-	+	-	-	concavity



3. A company producing lawn chairs has total cost given by  $C(q)$  and revenue given by  $R(q)$  measured in dollars where  $q$  is the quantity of lawn chairs.

(a) If  $C'(52) = 12$  and  $R'(52) = 25$ , approximately how much profit is earned by the 53<sup>rd</sup> item?

additional cost      additional revenue

$$\text{Additional profit} = 25 - 12 = \$13$$

(b) If  $C'(52) = 12$  and  $C(52) = 25024$ , estimate  $C(55)$

$$C(55) \approx C(52) + 3 \cdot 12 = 25060$$

# of additional items