

## MATH 122 WORKSHEET 6

Show all work for full credit.

1. A company's revenue from car sales,  $R$  (in thousands of dollars), is a function of advertising expenditure,  $a$ , in thousands of dollars, so  $R = f(a)$ .

a. What does the company hope is true about the sign of  $f'$ ? Why?

b. What does the statement  $f'(50) = 2$  mean in practical terms? Give units.

2. Suppose that  $f(x)$  is a function with  $f(12) = 81$  and  $f'(12) = 7$ .

a. Estimate  $f(14)$ .

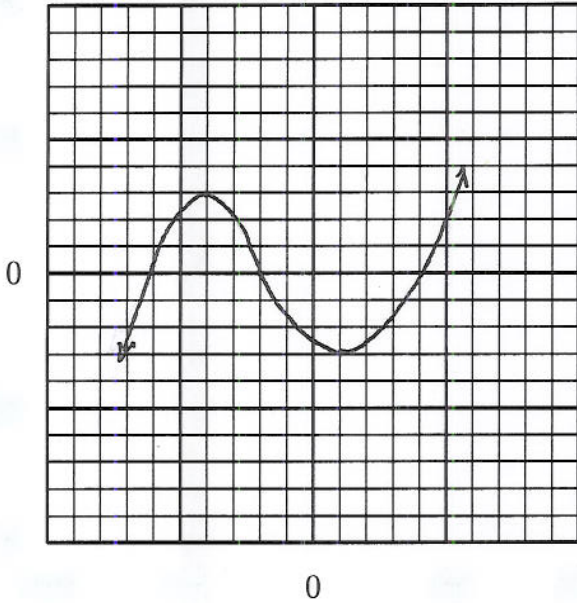
b. If the actual value is  $f(14) = 98$ , what does your answer in (a) tell you about the concavity of  $f(x)$  close to  $x = 12$ ? Explain.

3. The table below shows marginal cost,  $MC$ , and marginal revenue,  $MR$ , for some good.

$q$	5000	6000	7000	8000	9000	10000
$MR$	60	58	56	55	54	53
$MC$	48	52	54	55	58	63

Should production be increased or decreased from  $q = 6000$ ? Explain.

4. Given the following graph of  $f'(x)$ , determine the intervals over which  $f(x)$  is increasing, decreasing, concave up, and concave down.



5. The graph of  $y = f(x)$  is given. Are the following quantities positive, negative, or zero?

- a.  $f(A)$  \_\_\_\_\_ b.  $f'(A)$  \_\_\_\_\_ c.  $f''(A)$  \_\_\_\_\_
- d.  $f(B)$  \_\_\_\_\_ e.  $f'(B)$  \_\_\_\_\_ f.  $f''(B)$  \_\_\_\_\_
- g.  $f(C)$  \_\_\_\_\_ h.  $f'(C)$  \_\_\_\_\_ i.  $f''(C)$  \_\_\_\_\_
- j.  $f(D)$  \_\_\_\_\_ k.  $f'(D)$  \_\_\_\_\_ l.  $f''(D)$  \_\_\_\_\_

