

Exercise 6.3

- For each of the following functions, find $f(-x)$. Deduce that the functions are even. Sketch the graph of $f(x)$ in each case.
 - $f(x) = 2x^2 - 1$
 - $f(x) = \frac{1}{x^2 + 1}$
 - $f(x) = x^4 - 2x^2$
 - $f(x) = |x| + 1$
 - $f(x) = \ln |x|$
- For each of the following functions, find $g(-x)$. Deduce that the functions are odd. Sketch the graph of $g(x)$ in each case.
 - $g(x) = \frac{3}{x}$
 - $g(x) = -2x^3$
 - $g(x) = x + \frac{1}{x}$
 - $g(x) = 2x^3 - 3x$
 - $g(x) = 2 \sin 2x$
- The function f is periodic with period 4 and

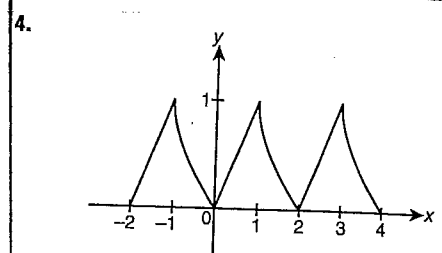
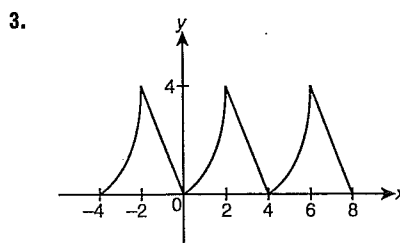
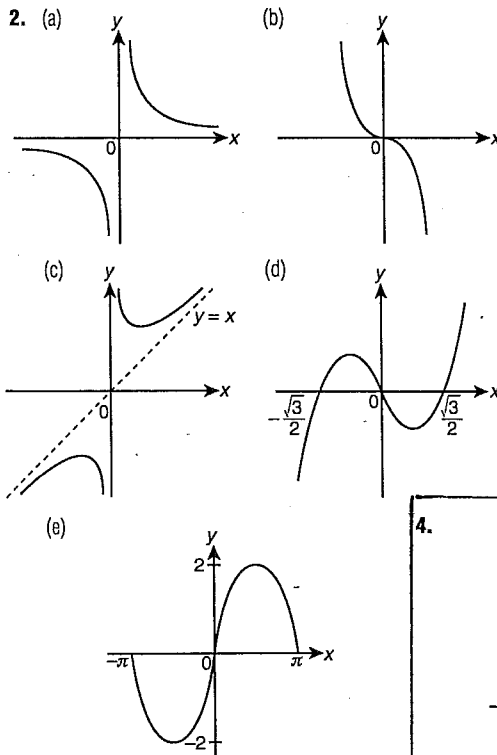
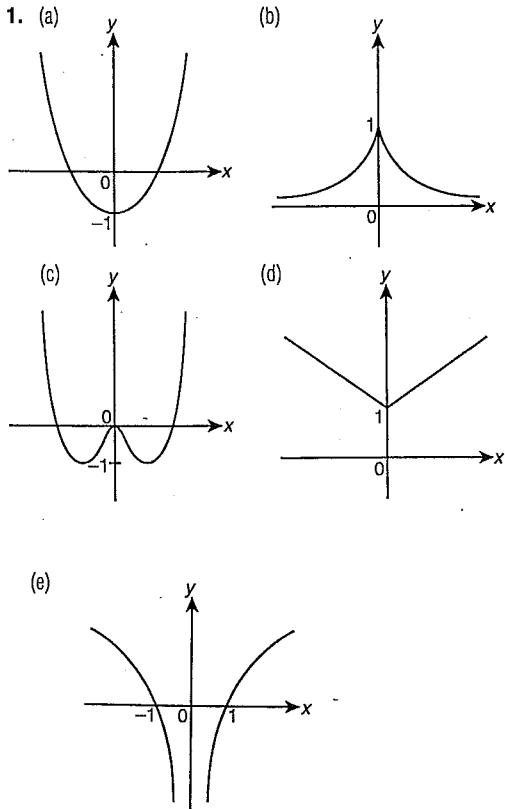
$$f(x) = x^2, 0 \leq x < 2,$$
 and

$$f(x) = 8 - 2x, 2 \leq x \leq 4.$$
 Sketch the graph of $f(x)$ in the range $-4 \leq x \leq 8$.
- The function $g(x)$ is periodic with period 2 and

$$g(x) = x, 0 \leq x \leq 1,$$
 and

$$g(x) = (2 - x)^2, 1 < x \leq 2.$$
 Sketch the graph of $g(x)$ in the range $-2 \leq x \leq 4$.
- Determine the nature, increasing or decreasing, of each of the following functions in the given interval.
 - $f(x) = 8 - \sqrt{x - 5}, 5 \leq x \leq 10$
 - $g(x) = x(x - 6), 0 \leq x \leq 3$
 - $h(x) = 2ax - x^2, a \in \mathbb{R}^+, 0 \leq x \leq a$

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5. (a) decreasing (b) decreasing
(c) increasing