

**You should be able to solve the following without a calculator**

- [1] [a] If  $f(x) = x^2 + 3x - 5$ , find  $f(-2)$ . [b] If  $f(x) = \frac{2x}{x^2 + 1}$ , find  $f(3)$ .
- [c] If  $f(x) = 5 - 2\sqrt{4 - x}$ , find  $f(-5)$ .
- [2] Find the domains of the following functions.
- [a]  $f(x) = x^2 + 3x$  [b]  $f(x) = \frac{5}{2x - 3} - 1$
- [c]  $f(x) = \sqrt{8 - x} - 6$
- [3] Find the ranges of the following functions.
- [a]  $f(x) = \frac{2}{x + 5} - 4$  [b]  $f(x) = 7 - \sqrt{x + 9}$
- [4] [a] If  $f(x) = 2 - 3x - x^2$ , find  $f(a - 1)$ . [b] If  $f(x) = 2x^2 + 5x + 1$ , find  $f(a + 3)$ .
- [5] Which of the following are functions?
- [a]
- |        |   |    |    |   |
|--------|---|----|----|---|
| $x$    | 2 | 5  | 8  | 9 |
| $f(x)$ | 3 | -2 | -2 | 1 |
- [b]
- |        |   |    |   |   |
|--------|---|----|---|---|
| $x$    | 6 | 4  | 7 | 4 |
| $f(x)$ | 3 | -2 | 4 | 1 |
- [c]
- |        |    |   |   |    |
|--------|----|---|---|----|
| $x$    | -1 | 3 | 0 | 10 |
| $f(x)$ | -1 | 3 | 0 | 10 |
- [6] Find the inverses of the following functions.
- [a]  $f(x) = 5 - 2x$  [b]  $f(x) = 4 - \sqrt{3 - x}$

**In addition, you should expect problems of the following types**

- Section 16.1.2: Finding the value of  $f(a)$  from a graph of  $y = f(x)$
- Section 16.1.5: Determining if a graph represents a function
- Section 16.3.2: Using interval notation
- Section 16.5.1: Determining if a graph represents a one-to-one function
- Section 16.5.2: Drawing the graph of the inverse of a function

**Answers**

- [1] [a]  $-7$  [b]  $\frac{3}{5}$  [c]  $-1$
- [2] [a] all real numbers [b]  $\left\{x \neq \frac{3}{2}\right\}$  [c]  $\{x \leq 8\}$
- [3] [a]  $\{y \neq -4\}$  [b]  $\{y \leq 7\}$
- [4] [a]  $4 - a - a^2$  [b]  $2a^2 + 17a + 34$
- [5] [a] yes [b] no [c] yes
- [6] [a]  $f^{-1}(x) = \frac{5 - x}{2}$  [b]  $f^{-1}(x) = 3 - (4 - x)^2$