

**Math 114**  
**Functions Review**

**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]

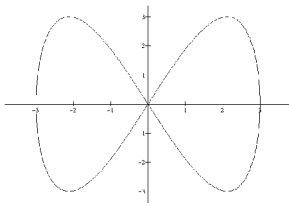
|        |    |   |   |    |
|--------|----|---|---|----|
| $x$    | -1 | 3 | 0 | 10 |
| $f(x)$ | -1 | 3 | 0 | 10 |

[6] Find the inverses of the following functions.

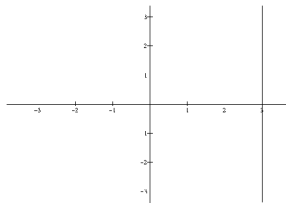
- [a]  $f(x) = 5 - 2x$  [b]  $f(x) = 4 - \sqrt{3 - x}$

[7] Which of the following graphs represent functions ?

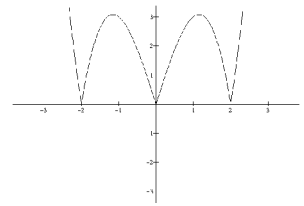
[a]



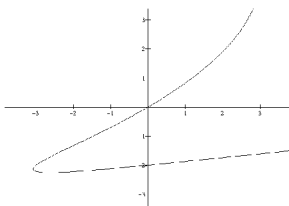
[b]



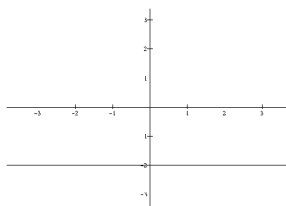
[c]



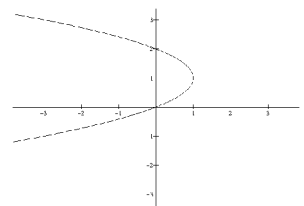
[d]



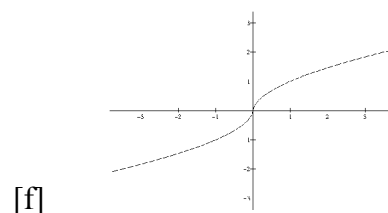
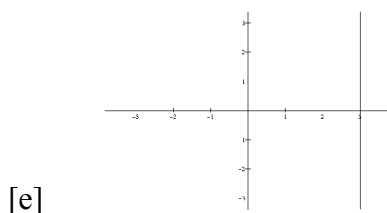
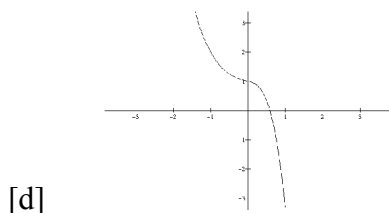
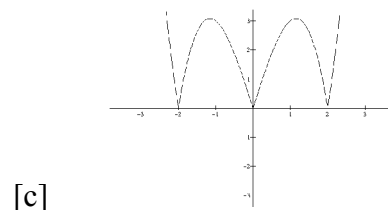
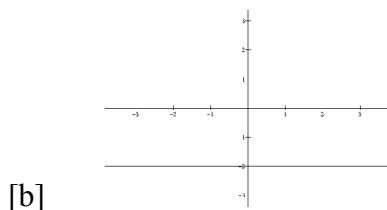
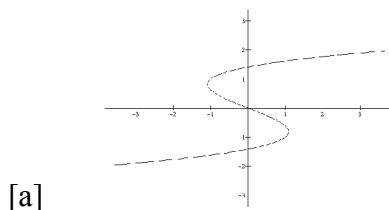
[e]



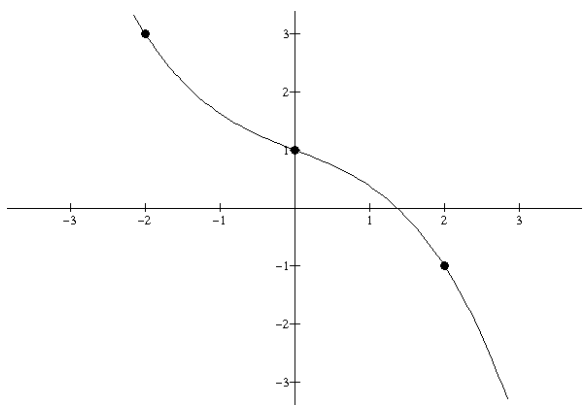
[f]



[8] Which of the following graphs represent one-to-one functions ?

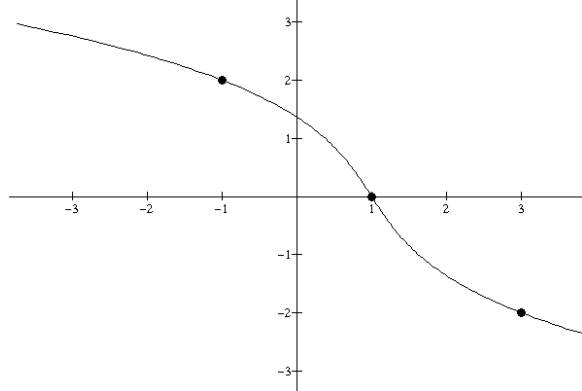


[9] Sketch the graph of the inverse of the following function.



## 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] | $f^{-1}(x) = 3 - (4-x)^2$           |     |                |     |     |     |     |     |     |
| [7] | [a] | no                          | [b] | no                                  | [c] | yes            | [d] | no  | [e] | yes | [f] | no  |
| [8] | [a] | no                          | [b] | no                                  | [c] | no             | [d] | yes | [e] | no  | [f] | yes |



[9]