

### SAMPLE QUESTIONS FOR TEST IV

Unless otherwise specified, the domain of a function  $f$  is assumed to be the set of all numbers  $x$  for which  $f(x)$  is a real number.

1. If  $f(x) = x^2 + 1$ , the range of  $f$  is the set of all numbers  $y$  such that

- (A)  $y \geq -1$       (B)  $y \geq 0$       (C)  $y \geq 1$       (D)  $y \geq 2$

2. If  $f(x) = \frac{2x-3}{4}$ , then  $f^{-1}(x) =$

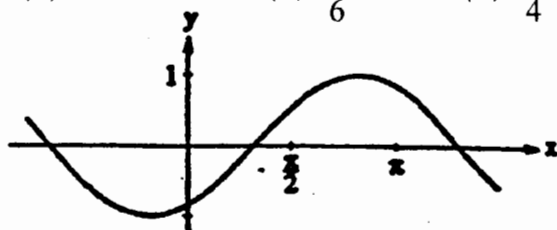
- (A)  $\frac{4x-3}{2}$       (B)  $\frac{4x+3}{2}$       (C)  $\frac{2x-3}{4}$       (D)  $\frac{2x+3}{4}$

3.  $\log_3 37$  is between

- (A) 1 and 2      (B) 2 and 3      (C) 3 and 4      (D) 4 and 5

4. If  $0 \leq \theta \leq \frac{\pi}{2}$  and  $\sin \theta = \tan \theta$ , then  $\theta =$

- (A) 0      (B)  $\frac{\pi}{6}$       (C)  $\frac{\pi}{4}$       (D)  $\frac{\pi}{3}$



5. The figure above could be the graph of  $y =$

- (A)  $\cos\left(x + \frac{\pi}{3}\right)$       (B)  $\cos\left(x - \frac{\pi}{3}\right)$       (C)  $\sin\left(x + \frac{\pi}{3}\right)$       (D)  $\sin\left(x - \frac{\pi}{3}\right)$

6. If  $\sin x = \frac{3}{5}$  and  $0 < x < \frac{\pi}{2}$ , then  $\tan x =$

- (A)  $\frac{3}{2}$       (B)  $\frac{4}{3}$       (C)  $\frac{5}{4}$       (D)  $\frac{3}{4}$

7.  $\log_3 27 =$

- (A) 81      (B) 9      (C) 3      (D)  $\frac{1}{3}$       (E)  $\frac{1}{9}$

8. If  $f(x) = 2x + 5$  and  $g(x) = 1 - x^2$ , then  $f(g(2)) =$

- (A) -3      (B) -1      (C) 1      (D) 2      (E) 9