



SAMPLE MATHEMATICS TEST

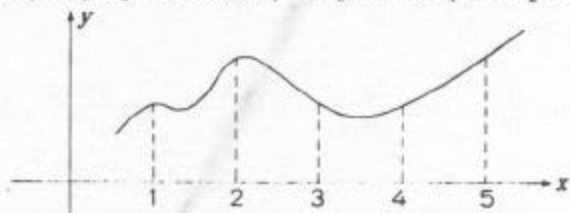
Pre-Calculus Proficiency

TOPICS ON TEST : Geometry and measurement, graphs of functions, word problems and modeling, concept formation, numerical awareness, exponential functions, exponents and logarithms, equations and factoring, functional notation, inequalities, absolute value, trigonometry.

1. Definition: A function is *increasing* on the interval $[a, b]$ if and only if $f(x_1) < f(x_2)$ whenever $x_1 < x_2$, where x_1 and x_2 are any numbers in $[a, b]$.

The function f , pictured in the graph on the right, is increasing on the interval

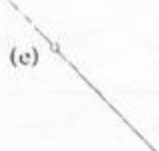
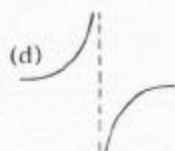
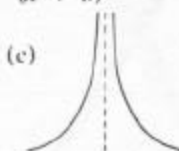
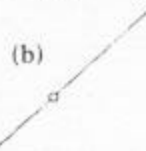
- (a) $[1, 2]$ (b) $[2, 3]$ (c) $[3, 4]$
(d) $[4, 5]$ (e) none of these



2. Given a rectangle with sides of length x and width y . Suppose the length x is doubled and the width y is halved. The new perimeter is

- (a) $4x + y$ (b) $(2x)\left(\frac{y}{2}\right)$ (c) $2x + \frac{y}{2}$ (d) $x^2 + y$ (e) $x^2 + \frac{y}{2}$

3. Which of these curves best resembles the graph of $f(x) = \frac{(x-2)(x+3)}{(x+3)}$?



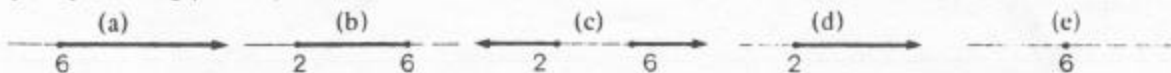
4. If $F(x-2) = \frac{x+3}{x-4}$, then $F(5) =$

- (a) -6 (b) $\frac{10}{3}$ (c) 5 (d) $\frac{23}{4}$ (e) 8

5. If $\log_2 16 = 8 \cdot 2^{-x}$, then $x =$

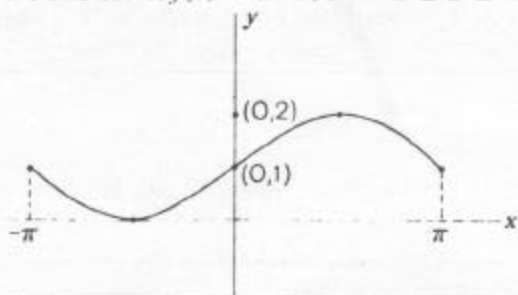
- (a) -7 (b) $-\frac{4}{3}$ (c) -1 (d) $-\frac{2}{3}$ (e) 1

6. The graph representing $|x-4| \geq 2$ is



7. Which of these choices best describes the alteration made to the graph of the sine curve, $f(x) = \sin x$, for $-\pi \leq x \leq \pi$?

- (a) The amplitude of the graph was doubled.
(b) The graph was shifted to the left π units.
(c) The period of the graph was decreased to π units.
(d) The graph was reflected about the x -axis.
(e) The graph was shifted up 1 unit.



Answers:

1. d
2. a
3. b
4. b
5. e
6. c
7. e