LEVEL IV
PRECALCULUS TEST
TYPICAL QUESTIONS FROM COMPETENCY AREAS

Elementary Operations with Numerical and Algebraic Fractions

$$\frac{3x-2}{x+2}-\frac{2}{x-2}=$$

(A) $\frac{3}{x+2}$ (B) $\frac{3x-4}{x^2-4}$ (C) $\frac{3x}{x^2-4}$ (D) $\frac{x(3x-10)}{x^2-4}$
(E) $\frac{3x(x-4)}{x^2-4x+4}$

Operations with Exponents and Radicals

$$\frac{x^{3a+2}}{x^{2a-1}}=$$

(A) x^{a+3} (B) x^{a-3} (C) x^{5a-1} (D) x^{a+1} (E) x^3

Linear Equations and Inequalities

For what value of t does $\frac{2t-1}{3t+4}=2$?

(A) -6 (B) $-\frac{9}{4}$ (C) $\frac{3}{2}$ (D) $\frac{9}{4}$
(E)There is no value of t satisfying this equation

Polynomials and Polynomial Equations

If $(x-1)(x^2-4)+2(x-1)(x+2)=(x-1)P$, then P=

(A) x^2-2 (B) x^2 (C) $x(x+2)$ (D) x^2+2 (E) $(x+2)^2$

Functions

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

Trigonometry

If $\sin \theta = \frac{3}{5}$ and $0 \leq \theta \leq \frac{\pi}{2}$, then $\tan \theta =$

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

Logarithmic and Exponential Functions

$\log_3 27 =$

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

Word Problems

If $\frac{2}{3}$ is $\frac{1}{2}$ of $\frac{4}{5}$ of a certain number, then that number is:

(A) $\frac{15}{4}$ (B) $\frac{5}{3}$ (C) $\frac{5}{6}$ (D) $\frac{5}{12}$ (E) $\frac{4}{15}$

Answer key: (1) D (2) A (3) B (4) C (5) B (6) E (7) C (8) B